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NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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:ar January 24, 1977 Vol. XI, No. 4

Brrrr!

By Ann Dooley
Of the CW Staff

DAYTON, Ohio — It's been a rough winter all across the country, but at the DP center of Dayco, a manufacturing company here, they opened the windows to let some of that cold air in.

Not that they liked the -20° weather, but it was the only way to keep the computer cool when the air conditioners had to be shut down to conserve energy, according to Les Pitstick, DP manager.

Because of the power drain caused by the severe weather, the data center's air-conditioning system was turned off last week. To maintain the IBM 370/125 at a moderate temperature, all the windows in the DP center were opened, letting in the frigid air, Pitstick said.

All went well until it was discovered that static electricity had begun building up in the card readers from the dry, cold air. So the air-conditioning system was reactivated — only to blow a fuse because the unit had frozen from the room's very low temperature.

Damage was estimated at several hundred dollars, according to Pitstick.

In the meantime, the windows remain open, operations continue and the employees' teeth never stop chattering.

Bell Vague on Participation In U.S. vs. IBM Litigation

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — U.S. Attorney General Griffin B. Bell will turn over supervision of all cases in which he had a hand while in private law practice to the Deputy Attorney General if they come up in the Justice Department, he told the Senate Judiciary Committee at confirmation hearings here last week.

However, Bell did not directly answer any questions on whether he would take part in decisions on the massive government antitrust suit against IBM.

Bell's law firm — King and Spalding in Atlanta — represents IBM on routine commercial matters, but he apparently has not had a direct hand in those cases, although he would share the profits from that work as a partner in the firm.

Conflict in Lineup

If Bell decides not to take part in U.S. vs. IBM, responsibility for handling it would go to the Deputy Attorney General. Sources last week indicated the person in line for that post is F.A.O. Schwarz Jr. (see story on Page 5).

If Schwarz does become Deputy Attorney General, it would add a new wrinkle to the Justice Department lineup because he is currently a lawyer with Cravath Swaine and Moore, the firm representing IBM in the antitrust case. Schwarz would therefore have to take himself off the case.

Noting that King and Spalding "must be a good [law firm] because you have some very substantial clients," Sen. John H. Heinz (R.-Pa.) raised the question of conflict of interest.

Heinz specifically referred to such clients as "IBM, which is currently in litigation with the Justice Department on an antitrust case," and to CocaCola, commenting that not everyone drinks Pepsi.

Bell is "aware of the conflicts problem," he responded, and said he "hopes to avoid"

(Continued on Page 5)

With Software, Hardware Additions

IBM System 32 Grows in Sophistication

By Don Leavitt
Of the CW Staff

ATLANTA — A Fortran IV compiler, an enhanced System Control Program (SCP) and several other pieces of software just introduced by IBM for its System 32 expand the range of users that might be interested in that small computer, industry sources agree.

Originally touted as a packaged solution to the problems of DP-naive organizations, the system now includes the tools of some of the most sophisticated computer users.

In addition to the SCP update and Fortran, IBM has announced a Subroutine Library-Mathematics (SL-Math), a Statistical System and a Job Analysis System (JAS/32). Hardware, including a Control Storage Increment to handle the Fortran programs and a print belt with Fortran symbols, was also introduced.

The Fortran compiler "contains features defined in" the American National Standards Institute (Ansi) 1966 specifications, IBM said. Thus it appears to be a subset of that standard and of the revised standard now under Ansi review.

The compiler is said to have better internal performance than the Fortran available on either the IBM 3 or the 1130.

A source program entry facility and an overlay capability are included in addition to features of the language itself, IBM said.

The SCP revision adds capabilities such as scientific macros, job stream support, improved data management and library techniques, a spokesman noted. The enhanced SCP is required to use the Fortran compiler or any of the object programs it generates, he added.

SL-Math is written in Fortran IV and includes routines to help compute functions such as array operations, linear equations, roots of functions, differentiation, interpolation and approximation, according to the company.

Also written in Fortran IV, the Statistical System was designed to work with stepwise linear regression analysis, factor analysis, variance analysis and polynomial curve fitting. As with SL-Math, this package

(Continued on Page 8)

Because Approval Appealed in Court

FCC Delays Start of Interstate Dataspeed Tariff

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. — Federal Communications Commission (FCC) approval of an interstate tariff for the AT&T Dataspeed 40/4 was sent into court last week and, as a result, the tariff did not go into effect as scheduled.

Although AT&T had filed interstate rates for the device following FCC approval, the commission voted last week to postpone the effective date for 15 days or until the U.S. Court of Appeals for the Second Circuit in New York can consider the issue.

The court has scheduled oral arguments to stay the FCC approval for Jan. 25, according to a court spokesman.

A petition for reconsidering the FCC approval was first filed by IBM. The Computer & Communications Industry Association (CCIA) filed similar petitions with the FCC (see story on Page 39) and the U.S. Appeals Court in the District of Columbia.

The District of Columbia court ruled the CCIA petition should be combined with the IBM proceeding in New York. The FCC denied the CCIA request to reconsider its own decision, but it then postponed the effective date of the AT&T tariff pending consideration by the New York court.

Commenting on the latest FCC tariff postponement, an AT&T spokesman said "we are obviously disappointed since the [FCC's] delay makes our customers again wait for a service they need and want.

"However, we are confident the court will uphold the commission's decision," he added.

Costs to Users

The rates filed by AT&T would have cost users $68/mo for a basic keyboard/display version of the Dataspeed 40/4 with an additional $102/mo for an attached printer. Installation would have added a one-time charge of $100.

In addition, the controller needed for various configurations including clusters of CRTs up to a total of six devices would have ranged from $157- to $185/mo depending on the configuration required by the customer. Installation of the controller would have cost an additional $100.

The proposed interstate rates were the same as originally filed early in 1976. In March of last year, however, the tariff was denied when Walter Hinchman, chief of the FCC's Common Carrier Bureau, issued a ruling that the Model 4 in the Dataspeed 40 series was a DP device and therefore could

(Continued on Page 6)

What Verdict Lurks for IBM? Maybe the Shadow Knows. . .

By Molly Upton
Of the CW Staff

LOS ANGELES — Court observers here are asking who hired the shadow jury, but so far there is no answer.

Six people have been faithfully attending only those portions of California Computer Products, Inc.'s (Calcomp) antitrust suit against IBM open to the jury, and they appear to be a shadow jury.

A shadow jury would presumably be asked to render a "verdict" at the trial's conclusion, giving attorneys some feeling for how and why the verdict was reached and whether another jury would be likely to come to the same conclusion. This would aid in the preparation of future cases.

The six persons who have been filing into the courtroom almost every day take notes occasionally, as do the real jurors, but attend only those portions of the trial at which the real jury is present.

There are two blond women in their 20s, a middle-aged woman, two men about 26 — one clean-shaven, the other with a moustache and longer hair. There is also a dark-haired woman, probably in her late 20s, who said she has been a court reporter.

Last week the older woman stayed during a bench conference and then was absent the following day. One theory is that the members of this group are trying to squelch suspicion in the courtroom that they are a shadow jury.

Even Judge Ray McNichols seems to have

(Continued on Page 6)

Coast Guard Admits DP Systems Limited In Halting Oil Spills

By John P. Hebert
Of the CW Staff

WASHINGTON, D.C. — Although the U.S. Coast Guard uses computerized vessel-tracking systems, it can't prevent disasters like that involving the Argo Merchant because it has no coastal authority beyond the three-mile limit.

The Argo Merchant, which strayed from the shipping lanes leading into Boston Harbor in mid-December, grounded and broke in half, losing most of the 7-1/2 million gallons of oil it carried to the Atlantic Ocean.

"According to U.S. Coast Guard marine casualty statistics, the number of collisions and groundings in U.S. waterways rose

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Please address all correspondence to the appropriate department at 797 Washington Street, Newton, Mass. 02160. Phone (617) 965-5800. Telex 92-2529.

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Preview of Interim Report?

Terminals Not Bank Branches: EFT Unit

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C.— Recent testimony by the National Commission on Electronic Fund Transfers (EFT) gave the industry a preview of what to expect when the commission's Interim Report appears Feb. 23.

In testimony before the Senate Subcommittee on Financial Institutions, Commission Chairman William B. Widnall and several other commissioners went as far as saying EFT terminals are not branch banks and should not be regulated as stringently.

This, however, was only a first step, and the question of exactly how terminals should be regulated will be addressed in the Interim Report, sources said.

At meetings in Jacksonville, Fla., this month, the Commission's Regulatory Issues committee seemed to be leaning toward regulating the services the terminals provide rather than the deployment of the terminals themselves.

Another consensus seems to be that the regulation should apply to funds transfer functions and not to information-type functions such as credit authorization and check verification.

The committee is also expected to address the question of sharing EFT facilities.

While the commission's Regulatory Issues Committee was discussing these issues in Jacksonville, the Department of Justice submitted to the commission its position on EFT facilities sharing. Its view: Sharing should be based on the free market approach, and existing federal antitrust laws should govern EFT activity for the time being.

In its policy statement, the Justice Department listed what it saw as the numerous drawbacks to mandatory sharing. In support of its proposed free market scheme, the department noted that while antitrust laws encourage individual rather than joint approaches in the competitive marketplace, they also recognize that in certain situations a joint venture can be both necessary and tend to foster competition.

The Justice Department also suggested the commission might want to expedite procedures for entry into EFT to provide equal opportunity for all.

It did not, however, issue any guidelines for the procedure.

Although the commissioners advocated less stringent laws for EFT systems, they cautioned they did not intend "to recommend any alteration in the division of powers between the individual states and the Federal Government in regard to the regulation of depository institutions."

Proper guidelines for the regulation of the deployment of EFT terminals are found neither in the McFadden Act nor the 1933 Banking Act. These statutes, as interpreted, restrict deployment of EFT terminals and thereby reduce the availability of EFT services to consumers, according to commission members' testimony.

"If these restrictions remain in place, the deployment of EFT terminals and the development of EFT services may well be impeded," they told the subcommittee.

The greatest impediment to implementing the technology that can provide the benefits of EFT to the consumer is the uncertainty about the legal environment within which EFT systems will operate in the future, their testimony indicated.

The commissioners cited consumer concern over the changes EFT will bring that will reduce the benefits they obtain from the existing payments mechanism without increasing other benefits and services. These include the loss of float and stop-payment privileges.

In the commission's view, "the apparent inconveniences to the consumer associated with the movement toward EFT can be greatly reduced by the private sector if a legal framework is created in which EFT terminals can be installed with reference not to existing law governing branching, but rather a new set of rules."

Consumers are also concerned about possible violations of their privacy through misuse of an EFT system and the higher risks of fraud and theft as well as the reliability of EFT systems, the subcommittee was told.

While the commission is still investigating these concerns, testimony pointed out that "if EFT development jeopardizes individual rights, and if the private sector does not respond, government action will be required."

Close attention, however, will first be given to the ability of the private sector, the states (through the Uniform Commercial Code) and the Federal Reserve System to address these problems, the commissioners said.

FCC Gives Go-Ahead to SBS

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. — The Federal Communications Commission (FCC) has given approval for Satellite Business Systems (SBS) to operate a domestic satellite communications service for data, voice and image transmission users.

SBS is a partnership made up of Comsat General Corp., IBM and Aetna Life and Casualty which will provide satellite service in the 12- and 14 gHz bands using all-digital transmission methods.

Service will be provided in the 48 contiguous states using two stationary orbit satellites and "several hundred small earth stations," along with tracking, telemetry and command centers at Franklin Lakes, N.J., and Agoura, Calif.

When the SBS application was first proposed, opponents cited possible built-in advantages between the satellite carrier and IBM. In order to cover this possibility, the FCC ruled SBS cannot have bundled offerings of DP and communications services.

In addition, IBM will not be allowed to "either sell or promote SBS services to IBM customers or to offer a discount or other preference to IBM customers who also subscribe to SBS.

"And SBS will not be allowed to sell or promote IBM DP equipment or services," the FCC added.

The commission said that even if it were to accept the various arguments that SBS entry could lessen competition, the "public interest benefits outweigh potential anticompetitive concerns . . . particularly in view of the conditions it had imposed."

Nevertheless, the FCC said it would scrutinize the market and SBS "on a continuing basis," looking for the earliest possible indications "that future action would be appropriate."

SBS will become a competitor of AT&T and other carriers when it begins operation.

Responding to the FCC decision, an AT&T spokesman said "by 1980, when SBS is scheduled to start operations, we hope that the FCC would have eliminated its original three-year restriction against AT&T providing private-line service on its domestic satellite system."

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Memos Show IBM Considered Leaks to Combat Lessors

By Molly Upton
Of the CW Staff

LOS ANGELES — IBM apparently felt the financial community was in danger of becoming too enamored with leasing companies in 1968 and decided to let Wall Street know that future conditions under IBM's control might change the lessors' profit pictures.

That scenario of almost a decade ago was presented through memos introduced here recently at the California Computer Products, Inc. (Calcomp) vs. IBM antitrust trial.

And, the documents showed, an IBM director who was a former president of the New York Stock Exchange was chosen to play a role.

A draft memo, prepared by Treasurer K.N. Davis' for signature by Chairman Thomas J. Watson Jr. in September 1968, suggested the corporation confer with IBM director Keith Funston on how to tell Wall Street about "exposures" in the leasing company concept.

This apparently referred to the direct relationship between a lessor's rate of return and the lease-purchase multiplier set by IBM (see story on Page 7).

IBM at that time was planning a higher multiplier to increase the number of months it would take for monthly rental charges to equal the purchase price on 370s compared with those of the 360. Thus it would take longer for lessors to recoup their investments.

The Davis/Watson draft said: "We think that if investors and leasing company operators really understood the exposures in the leasing company concept, reduced activity should result, which would be helpful both to us and to investors who could get hurt by overspeculation in these stocks.

"Also, we are continuing to try to see whether there is anything we should be doing with the [Securities and Exchange Commission] or the New York Stock Exchange.

"We are working with outside counsel on this and we are going to ask Keith Funston to give us the benefit of his advice as well."

Leaks Discussed

Some memos written earlier — in June of that year — indicated IBM already had established communications with the financial community.

At that time, there was some speculation in the financial press about a possible future line of mainframes after a speech made by Gene Amdahl in Canada. That line eventually became the 370.

A June 24 memo, drafted for Frank T. Cary's signature by John R. Opel, then vice-president of the Corporate Finance and Planning Staff, to H.M. Sibley, assistant treasurer, outlined new guidelines for controlling what technical people could tell members of the press and asked whether it would be "useful to 'leak' [information on the fourth generation] to the investment community."

In his reply, Sibley attached a news release from White Weld & Co. that indicated this investment firm already knew quite a bit about IBM's future plans.

The White Weld news release said in part: "In the past several months IBM has been discussing prospective corporate advances in circuit technology with the investment community. It has also explored the implication of such advances on the speed of computers and the cost of processing to the computer user."

In line with a response from IBM attempting to control speculation about the "fourth generation;" White Weld remarked it expected evolutionary changes "in no way as far-reaching as was the 360 at the time it was introduced."

Quarter Earnings Set Record for IBM; Year Net Up 20.5%

By Toni Wiseman
Of the CW Staff

ARMONK, N.Y. — IBM's earnings for the fourth quarter of 1976 set a record for any quarter in the company's history.

Fourth-quarter earnings rose 14.5%, an increase attributed in large part to a strong showing outside the U.S. and an increase in sales rather than rentals.

Earnings for the year climbed 20.5%.

For the quarter ended Dec. 31, 1976, earnings totaled $674 million or $4.47 a share compared with $589 million or $3.94 a share in the year-ago period.

Revenues also rose, to $4.5 billion compared with $4.06 billion in the same 1975 quarter.

Year Results

In the year, IBM's earnings reached $2.4 billion or $15.94 a share on revenues of $16.3 billion compared with 1975 earnings of $1.98 billion or $13.35 a share on revenues of $14.4 billion.

This represents a 20.5% increase in earnings and 12.9% increase in revenues.

"Operations outside the U.S. for the year 1976, included in the consolidated results, showed net earnings of $1.3 billion, an increase of $212 million over 1975," according to Frank T. Cary, chairman of the board.

"Gross income from those operations was $8.1 billion, an increase of $882 million over the year before," he added.

During 1976, purchases of DP equipment by customers were strong around the world, with the fourth quarter setting a historic high, Cary noted.

IBM's revenues from outright sales rose 21.1% to $1.84 billion in the quarter, and 31.1% to $5.96 billion in the year. Rentals, by comparison, rose only 5.1% to $2.67 billion and 4.6% to $10.3 billion in the quarter and year respectively.

Domestic vs. Foreign

Profits and revenues from domestic operations increased by slightly higher percentages than did the results from foreign operations, but foreign business continued to account for more than half of IBM's results.

Earnings from foreign operations rose about 19% to $1.32 billion, up from $1.11 billion in 1975, accounting for almost 55% of IBM's total earnings.

Foreign revenues rose about 12% to $8.15 billion, up from $7.27 billion a year ago. Foreign revenues therefore accounted for slightly more than 50% of total revenues.

U.S. operations earnings climbed 22% to $1.08 billion, up from $884 million in 1975, while U.S. revenues rose nearly 14% to $8.15 billion from $7.17 billion a year ago.

Incoming orders were "significantly higher" in 1976 than 1975, Cary said, resulting in a year-end backlog well above that of a year earlier, despite the high volume of shipments during 1976.

Life of Georgia Depends on ADR's ROSCOE® For Faster Job Turnaround, Faster Maintenance and Expanded System Access

Two years ago, Life Insurance Company of Georgia installed ROSCOE, ADR's on-line conversational programming system. It was initially installed to speed computer program development, but Life of Georgia quickly found that ROSCOE also expanded direct computer access. Interactive procedures made the system easy to use without extensive training so that virtually any department could enter and update data through their own terminals. Self-prompting routines, using ROSPROCs, could direct users through even complex systems one step at a time. Information could be entered without keying-in locations or other detailed instructions, and corrections could be easily entered right over the old information, without re-keying whole data.

Today, nine ROSCOE equipped terminals are located throughout the company, giving many departments direct on-line access to 3400 operating programs. System specialists no longer wait in line to do a routine job.

Program development goes faster, too. With data-set recall, programmers call up the information they need, key-in required changes, and send it back again—without handling cards or paging through listings. "The greatest time savings comes from compiling COBOL programs," noted Earl Ryan. "ROSCOE asks the user what he wants to do and then tells him to enter the changes he wants to apply. As a result, turnaround time has been reduced at least 30%. And we have virtually eliminated JCL type errors."

"If we were to put our programmers back on the old keypunch system, we would have a real morale problem. It would be very difficult to take ROSCOE away now," Earl Ryan added.

Each ADR product is not just a program but a complete package with full documentation and on-site support. ADR is the only software company with 50 branch offices and representatives in over 30 countries—each staffed with ADR-trained technicians.

"It would be very difficult to take ROSCOE away now . . . ," Life of Georgia Technical Analyst, Earl Ryan, speaking about ADR's on-line conversational programming system.

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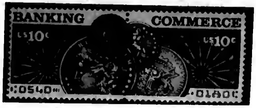

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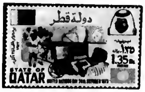

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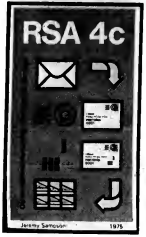

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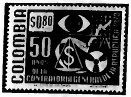

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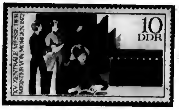

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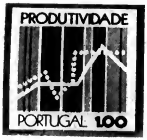
Stamp Collecting DP Style



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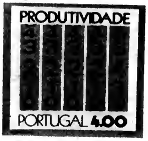

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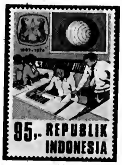
By M.W. Martin
Special to Computerworld

Since March 1972 when the first article about "paper" computers appeared in *Computerworld*, DP postage stamps have become a full-fledged philatelic specialty with its own collectors' organization and its own publication aptly titled *EDPhilately*.

When the topic of computers on stamps first came up, one thought only of mechanics — hardware on stamps.

And while this design still remains the most important feature of a DP stamp, collecting in the topic has expanded to include the many special event cancellations, meters used by DP companies and automated mail handling.



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One new U.S. issue falls into the DP category — the 1975 double issued for banking and commerce in the U.S. and for the Centennial Convention of the American Bankers Association (1).

The twin stamps both show check-encoding numerals in computer script.

Stamps Issued Abroad

Abroad, there have been several issues from various parts of the world.

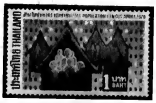
Automated mail handling was the subject of a 1975 stamp of South Africa (2), issued to publicize the use of its postal-code system.

Columbia's stamp of 1973 for the 50th anniversary of Comptroller-General's Office (3) depicts symbols of financial controls, including a punched tape and a reel.

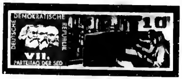
DP installations incidental to communications or industry appeared in six different sets of stamps.

A set of three stamps issued in 1976 by Niue to mark its achievements in the field of utility services includes a stamp showing the computer installation (4) of Niue's powerhouse at Tuila.

A 1973 series issued by Qatar for United Nations Day includes a stamp that shows DP equipment used in telecommunications (5).



(10)



(11)

A set of two stamps issued in November 1972 by East Germany (6) shows computers used in education. The set was issued for the 15th Central Fair of Masters of Tomorrow.

The last computer stamp in this series (9) belongs to a long set of stamps issued in 1974 by Indonesia for the 17th anniversary of Pertamina State Oil Enterprise.

From Portugal, we have an all-DP set — graphs, printout and computer figures (7 and 8) — issued April 11, 1973, for the Productivity Conference held January 17-22, 1972.

Two older stamps are also of interest: a punched card from Thailand (10) issued to publicize the 1970 census and a computer center in an East German factory (11).

To learn more about EDPhilately, *send a postcard to Martin, c/o* Computerworld, *797 Washington St., Newton, Mass. 02160.*

NCC Programming Contest Set

MONTVALE, N.J. — Programmers who qualify will have an opportunity to participate in a National Programming Contest at the National Computer Conference (NCC) in Dallas this summer.

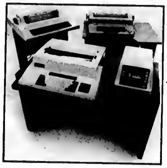
This contest was developed in an effort to involve DP professionals more directly in conference activities, according to Dr. Portia Isaacson, Conference chairman.

To qualify, programmers must complete a sample problem. Entries will be reviewed, and based on the quality of their solutions and about 240 people will be selected to participate in the contest.

No particular programming language will be required, and entrants will receive a list of languages, terminals and time-sharing services to be used in the contest.

The deadline for entering the qualifying round is March 1.

Official entry forms and sample problems may be obtained from Dr. C.E. Rodriguez, Computer Science Department, East Texas State University, Commerce, Texas 75428.



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Web of IBM Ties to Carter Administration Expands

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. — The web of IBM connections within the Carter Administration grew last week as the new President was sworn in for a four-year term.

The Senate quickly confirmed the appointment of three IBM directors to Cabinet posts and several lower level offices went to people with IBM contacts.

In addition, it appears that another Cabinet member has closer connections with the IBM camp than previously thought.

In the Cabinet, IBM directors Cyrus Vance, the new Secretary of State, Harold Brown, heading the Defense department and Patricia Harris, Secretary of Housing and Urban Development, were all swiftly confirmed by the Senate last week.

Griffin Bell, who comes from the law firm of King and Spalding, which often represents IBM in Atlanta, was given the nod as Attorney General and is therefore in charge of the government's antitrust suit against IBM.

On the next echelon of federal officers, Warren Christopher, who has close IBM ties, landed the slot of Undersecretary of State. He will be in charge of day-to-day operation of the department.

Christopher was a top aide to Nicholas deB. Katzenbach in the Justice Department; Katzenbach is now vice-president and general counsel at IBM.

Christopher comes from the law firm of O'Melvany and Myers, which is representing IBM in several West Coast antitrust cases, and has testified for IBM by affadavit in the government's case against the firm.

For privacy advocates, Christopher's record will be particularly disturbing since he sponsored the Army's plan for massive collection and computerization of information on civilians during the '60s.

In addition to Christopher, sources here have indicated that F.A.O. Schwarz Jr., currently with Cravath Swaine and Moore, the law firm representing IBM in the government suit, is in line for a top Justice Department post, perhaps as Deputy Attorney General.

Schwarz, who indicated recently that the "would rather not talk about" whether he had been in touch with Bell about the post, was No. 2 man on the IBM defense team behind Thomas D. Barr, until he left to head the Senate staff investigating the Central Intelligence Agency two years ago. He has since returned to the law firm.

Further, Juanita Kreps, confirmed as Secretary of Commerce last week, not only has ties to AT&T [CW; Jan. 10], but also to IBM.

As vice-president of Duke University, she worked closely with Duke President Terry Sanford, who is on the latest list of witnesses that IBM plans to call for its defense against the government charges of monopolization.

Charles Kirbo, Carter's closest adviser, who is also from the law firm of King and Spalding, told women's groups that Kreps had been suggested for the Commerce slot by IBM after Jane Cahill Pfeiffer, a former IBM vice-president, took herself out of running for the post, according to the *Privacy Journal*.

Bell Vague on Part In U.S. vs. IBM Suit

(Continued from Page 1)

any conflict.

President Jimmy Carter's choice for Attorney General said he would abide by his mentor's suggested two-year abstinence from private law practice following his tenure in Washington.

Although the Judiciary Committee's hearings were dominated by discussion of Bell's role as an Atlanta lawyer and then as a federal appeals court judge in the South's desegregation struggles, some of the Attorney General's thoughts on antitrust litigation were scattered throughout the proceedings.

Antitrust Laws Adequate

Bell contended the present antitrust laws are adequate to keep the U.S. free enterprise system healthy and to encourage competition.

"The weakness in the system is not the laws . . . The weakness in the system is that it is easy to beat the system. The court processes are so complicated, so slow, that once a case starts, it never seems to end. All you do is just stay in court," Bell said.

"As long as the court system is not adequate to finish a case within a reasonable time, it is difficult to enforce the antitrust laws," he added. Bell also urged the senators to "think of the expense and the waste of resources that are involved as well."

Judges who will keep a close watch on large antitrust cases are the key to speeding up such suits, Bell suggested.

Large cases should not be allowed to "flow through the courts" on their own, he contended. If a judge keeps tight control over discovery and sets the stage at which certain necessary legal tasks are to be accomplished, complex cases can be speeded up.

But he added that tight control of massive antitrust suits demands the close attention of already-overworked district court judges.

In this context, Bell said he might go to court to help speed complex cases along their way. "When there is a big case on, it would not be unusual for me . . . to appear in the case at some stage in order to see if we could expedite [it]."

Sen. James Abourezk (D-S. Dakota) asked Bell whether he would support legislation that would hold a company in violation of the antitrust laws once it passed a certain size.

Calling this "divestiture legislation," Ahourezk said proposals for such a law had been before Congress in the past and promised their reappearance again this year.

Bell said he thought the idea was a good one and that he hadn't thought of it before. Such a concept would be "worth looking at and I would be glad to look at it," he told the senators.

Noting some companies are clearly monopolies and others are border-line cases, the Attorney General indicated the Justice Department might have a case against AT&T.

The case against the telephone company, in which it is urged that its manufacturing arm, Western Electric, be severed, "is the sort of thing that you can make a case for by showing that [the company] keeps other people out of the market.

"Once you keep people out of the market, then the consumer suffers because you do not get as good a product at a lower price."

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COMPUTER ASSOCIATES

All Vendors Free to Make Gear for Any Software: IBM

By Ronald A. Frank
Of the CW Staff

NEWTON, Mass. — Although IBM will not support its operating system software on other vendors' machines, it has made a point of emphasizing the freedom other manufacturers have to produce equipment that works with other manufacturers' software [CW, Jan. 10].

In a brief filed as part of its antitrust suit with the Justice Department in 1975, IBM said: "Manufacturers typically develop software for their own systems, but the fact that this must be done is no more a barrier to entry than the fact that manufacturers must also design the hardware features of the product which they hope to market.

"If a manufacturer wishes to design machines which can use the software written for another machine, it certainly can."

The brief went on to cite examples where independent vendors had designed systems that could run IBM software.

This list included the Xerox Corp. Sigma 7 which reportedly runs Fortran and Cobol programs "installed on IBM computers"; the Digital Scientific Corp. Meta 4 which had microprogramming in read-only memory "to execute programs which operate on the IBM 1130 and 1800; and the General Automation, Inc. 18/30 which "can replace an IBM 1130 and perform tasks like inventory control, payroll, job scheduling, as well as scientific and engineering computation."

The brief did not specify how this IBM software, running on non-IBM systems, would be supported.

Calcomp vs. IBM Jury Seems to Have a Shadow

(Continued from Page 1)

suspicions. Prior to the brief holiday recess, he wished "both juries" a "Merry Christmas."

Assuming these people are a shadow jury, the party hiring them does not want its identity known for fear the people will lose their impartiality. Calcomp Chairman Lester Kilpatrick has vehemently denied Calcomp hired them or engaged a firm to hire them. An IBM spokesman also said IBM has not hired them.

But what of IBM's attorneys? David Boies of Cravath Swaine & Moore said his firm did not hire them and to his knowledge has not hired any kind of research firm that might have done so.

But he also said that since the value of a shadow jury depends on its not knowing the identity of its employer, he would not acknowledge that his firm hired a shadow jury even if it had.

Jack Brown of Brown and Bain said his firm did not directly or indirectly hire people to act as a shadow jury.

But there are more parties interested in Calcomp vs. IBM than those participating.

Memorex is the next plaintiff in line to try its antitrust case against IBM. A company spokesman said Memorex had not hired a shadow jury.

However, he pleaded attorney-client privilege when asked if Memorex is retaining a firm that specializes in research on jury reactions and aids in jury selection.

For the rest of the West Coast cases, IBM's law firm is O'Melveny & Myers of Los Angeles. A spokesman for that firm said he could not comment on whether it has either directly or indirectly hired a shadow jury, also pleading attorney-client privilege.

But, he said, the fact that he would not comment should not be construed one way or the other.

Transamerica Corp. attorneys flatly denied they or their client hired the people because of the expense involved.

While observers consider it unlikely that any individual plaintiff hired a shadow jury, Transamerica attorneys said the plaintiffs in the upcoming cases against IBM did not combine resources for such an action.

The Computer and Communications Industry Association also denied hiring the shadow jurors.

One theory is that some members of the shadow jury have college educations and on that basis provide a control group for the actual jury.

IBM objected to the lack of variety in that jury's economic status and, by implication, lack of education.

Another possibility is that the group was selected by a firm that researches juries and was assigned to this particular case without any interest or retainer by the parties in the case.

Or, perhaps, they're simply interested in watching an antitrust case. But they sure picked a lengthy one.

FCC Postpones Start Of Dataspeed Tariff

(Continued from Page 1)

not be offered by the telephone company since it violated the FCC findings in the first Computer Inquiry.

Under those rules, telephone companies are prohibited from offering DP devices or services except through wholly separate subsidiaries.

Shortly before the end of 1976, the FCC reversed the bureau chief and said the interstate tariff could go into effect pending the outcome of the second Computer Inquiry. In the text of that decision, released early this month, the commission said the characteristics of the Dataspeed 40/4 were different than the characteristics of a CPU and hence should not be considered as a DP service even though the terminal requires interaction with a CPU to operate.

Opponents of the FCC decision have argued the CRT operates in binary synchronous mode and can be clustered around a minicomputer controller. Both of these are features of DP terminal systems and take the Model 4 out of the realm of being strictly a communications device, making it a DP device.

Although the controversy over the interstate tariff for the Dataspeed 40/4 continues, intrastate tariffs have been approved in all areas served by Bell System companies.

While customers who operate under the intrastate tariffs were advised by local Bell System phone companies that the Model 4 is not to be used for transmission of data across state lines, however, industry sources agreed it is virtually impossible to guarantee that interstate usage is totally excluded.

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	Session	Topics	Session	Topics	Session	Topics	Session	Topics
Monday Feb 28, 1977 8 45-12·00	Concepts & Applications	Network Concepts Application Requirements Government/Commercial/ Industrial Solutions	Planning	Overview Definitions and Concepts System Planning	Design Concept	Design Review Role of Medical Information Systems in HIS State of the Art HIS/MIS Review	Industry Profile	Major Government and Com- Programs Pending Legislation Legislative Impact of National Health Insurance
Monday Feb 28, 1977 1·45-5 00	Planning & Implementation	RFP/Preparation Proposal Evaluation Government Commercial	Data Communications Systems	Hardware & Equipments Circuit Concepts Software Carriers & Services	Data Collection and Analysis	Data Collection Instruments Computer Systems Configuration Quantification of Data Collection	Claim Processing Techniques	Enrollment Utilization Review Provider Relations Beneficiary Services
Tuesday Mar 1, 1977 8 45-12 00	Computer Networking	Common Carriers Host Computers Distributed Processing Terminals	Design and Procurement	Design Methodology RFP Preparation Proposal Evaluations Acceptance	Systems Architecture	Equipment Profile Centralized vs. Decentralized design Case Studies Software Structure	Major Programs	MEDICAID MEDICARE FEP CHAMPUS Commercial
Tuesday Mar 1, 1977 1·45-5.00	Simulation, Evaluation, Measurement	Host Simulation Network Simulation Hardware Monitor Technical Control	Operations and Maintenance	Management Technical Control Fault Isolation Security	Software Design	HIS Operating Systems MIS Operating Systems Support Packages Data Base Requirements	Data Processing Systems	In-House EDS OSt HAS
Wednesday Mar 2, 1977 8 45-11 00	Case Studies and Technology	Government Commercial Private Long Range Forecast	System Design II	Introduction to Networks Case Studies Questions and Answers	Implementation and Planning	Planning Strategy Implementation Plans Cost Benefits Feasibility Study Case Studies	Future Trends in Claim Processing	Regionalization Expanded Role of EDP

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The Four-in-One Program will be held at the Deauville Hotel, Miami Beach, Florida from February 28, 1977 through March 2, 1977. Registration fee of $395.00 includes breakfasts and luncheons, as well as all course material. Team registrations are available for $300.00.

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Move Created Hardships for Lessors

Memos Show IBM Set 370 Prices to Encourage Rentals

By Molly Upton
Of the CW Staff

LOS ANGELES — When the IBM 370 series was introduced, prices were set to encourage renting and discourage purchasing, according to memos introduced here last week in the California Computer Products, Inc. (Calcomp) vs. IBM antitrust trial.

This move created difficulties for leasing companies that had made a successful business of purchasing and then leasing IBM 360 systems, the memos indicated.

IBM did this by increasing the lease/purchase ratio — increasing the number of months it took for rental charges to equal the purchase price, the documents showed.

One document introduced, a memo from T.C. Papes Jr., explained why. According to Papes, IBM was losing two percentage points of future revenue for each month a lessor's system exceeded its estimated multiplier life.

To correct this imbalance of shipments, Papes, who in 1967 was director of finance for the Data Processing Group, suggested that IBM should consider lower rental fees, and perhaps eliminute the purchase option, if it couldn't raise purchase prices.

Careful Calculations

IBM carefully calculated what the rate of return would be and how long it would take lessors to recoup their investments with different multipliers, documents showed.

On June 5, 1970, just prior to the approval of the 370 pricing announcement, A.M. Aldrich, IBM's manager of financial analysis, indicated to John R. Opel, then senior vice-president, that "on a return-on-revenue basis after taxes, the economy will harm the leasing companies by 6% and the IBM actions will harm the leasing companies by an additional 11%."

Using the effective multiplier of 53, which ultimately was approved, Aldrich assumed lessors would initially charge 88% of IBM's rental rate, as they had with 360s.

If lessors raised their prices to 95% of IBM's rental for the first three years, they could get into the black, he indicated.

Purchase Drop Predicted

One 1968 memo predicted a drop in lessors' purchases of 370s compared with 360s.

The 370 announcement "will undoubtedly place leasing companies in a precarious position in 1970-72 when most of their current customers' contracts will be subject to renegotiation," the memo predicted.

"Discounting of rental prices below the break-even point, coupled with a heavy displacement" of 360s because of 370 shipments, "will cause the weak companies to become unprofitable.

"The more established companies" are expected to purchase new systems "on a selected basis in order to satisfy their accounts; however, they will be operating at a disadvantage compared with today's environment based on the assumptions which underlie the forecast: higher purchase multipliers and a general increase in maintenance prices for NS [370] products."

IBM recognized that lessors were responsible for contributing to its increased ratio of sales compared with leases. But it also saw that lessors as a group represented a force larger than any mainframe competitor, a memo from Vice-President Warren C. Hume to the Management Review Committee in September 1967 indicated.

Rate of Payback

Multiplier	System	Return	Years
40	360/65 (512K)	14.6%	5.8
44	360/30 (32K)	12.4%	6.3
46	360/40 (128K)	11.4%	6.6
52	370	6.7%	8.3

Chart adapted from 1968 IBM figures shows effect of 370's multiplier on the length of time required by lessors to recoup purchase price.

Privacy Hearings Set On Private Eyes

WASHINGTON, D.C. — The Privacy Protection Study Commission will hold a public hearing on the activities of private investigation firms on Jan. 26 in Room 1318 of the Dirksen Senate Office Building here.

The commission will focus on the services provided by private investigation firms in connection with employment and promotion decisions as well as the impact such investigations have on the individual subject involved.

The commission is interested in such things as investigative methods and techniques, how records are kept and the content, format and manner of delivery of reports to clients.

The exchange of information between law enforcement agencies and private investigation firms in the course of this process will also be examined.

Those interested in participating should contact the commission immediately at 2120 L St. N.W., Washington, D.C. 20506.

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IBM Additions Turn System 32 Into Sophisticated Tool

(Continued from Page 1)

requires the Fortran IV compiler, the spokesman noted.

JAS/32 is a project control tool written in Basic Assembler to help managers schedule the time and resources required to complete complex operations, according to the spokesman. Utilizing Critical Path Method logic, it could be used by DP managers for planning their own internal activities, IBM suggested.

The enhanced SCP is provided free to System 32 users. The program products, planned for May availability, will carry license fees of $75/mo for Fortran, $50/mo each for SL-Math and the Statistical System und $57/mo for JAS/32.

On the hardwure side of things, the Control Storage Increment is a block of 4K words of additional storage required for the execution of Fortran object programs. It can be purchased for $1,350 or rented for $35/mo.

Fortran symbols are provided on all models of the System 32 equipped with serial printers, IBM said. On models with line printers, the symbols are provided by a 64-character Ebcdic print belt or by a newly introduced 48-character belt which can be purchased for $170 or specified as the standard system print belt, the spokesman explained.

The System 32 itself was introduced two years ago as the base for turnkey solutions to the needs of the unsophisticated user. Whole systems of programs were ready or under development for specific target groups. New Industry Application Programs (IAP) are still being announced from time to time.

During 1976, IBM broke away from the strictly IAP approach and introduced several generalized accounting packages that could be used by a variety of industries. But the essential idea was the same: Plug it in and use it — don't bother writing your own code.

Also last year, there were indications some IBM branch offices were providing potential System 32 users with the nemes of software houses that might be able to create programs not then available from IBM.

Right from the original announcement of the 32, users could get a Basic Assembler with which they could do their own thing, but IBM never emphasized that facility as it did the IAPs. Although RPG was made available later, the stress was still away from in-house development work.

Now with the introduction of the Fortran compiler and related hardware and software, the system appears to be equipped to support at least the basic needs of scientifically and engineering-oriented problem solvers.

Even the nonprogramming personnel that were original System 32 targets may benefit from these products. With a compiler available for their machines, they should be able to directly use many of the hundreds of Fortran programs now on the market or in the public domain.

Despite DP, Coast Guard Can't Stop All Oil Spills

(Continued from Page 1)

from 1,185 cases in fiscal year 1965 to 1,918 in fiscal year 1975," Rear Admiral Anthony J. Fugaro told the House Committee on Merchant Marine and Fisheries' Subcommittee on Coast Goard and Navigation in September.

The reported losses to vessels, cargo and property from these casualties rose $70 million to $103 million between those years; 50 people died and another 39 were seriously injured, Fugaro said.

These figures do not include shore damage or the costs of spilled oil cleanup.

The Coast Guard presently has one computer-based vessel-tracking system and is planning two others for inland waterways, according to a spokesmun for the Coast Guard's Vessel Traffic Service (VTS).

The operational system is located in Houston; a second is being installed at the VTS in New Orleans, he said.

A third is being planned to track ships in the bays and rivers around Manhattan Island by mid-1978, he added.

The Houston-Galveston VTS operution, equipped with a computer-based information and display system, is expected to prevent 38% of the collisions and 25% of all casualties, according to Fugaro.

"It is estimated that the operation of the New York VTS will prevent one-half of the collisions, about one-third of all casualties and produce direct monetary benefits of $2.4 million unnually, Fugaro stated.

In New York alone, "about 80 collisions, rammings and groundings occur annually, causing an average of six pollution incidents and $9 million in direct damages to vessels, property and cargo," Fugaro said.

The New York system, he added, will rely on computer-based storage, processing and vessel information display for traffic management functions.

Motorola Corp. has subcontracted with Occun Data Systems for development of the New York system, which will incorporate Modular Computer Products, Inc. (Modcomp) CRTs.

The device will show a digitized outline with major navigational aids and channel outlines of major waterways around the city, according to the VTS spokesman.

In Houston, a Lockheed Information Systems computer system shows a synthesized display of the Houston ship channel. The system will signal the display operator in time to notify a vessel of a pending collision, the spokesman suid.

The New Orleans VTS will utilize a CRT made by Burroughs Corp. similar to those used in aircraft avoidance systems.

Computer systems and CRT terminals are used in VTS traffic monitoring because they cut down on personnel and can keep information files on all vessels calling in, including cargo, destination, route, size, name and other factors affecting the vessel's safe navigation, the spokesman explained.

However, the Coast Guard "can't predict a collision situation between two ships with the present or planned systems. We can only rely on the accuracy of a ship's reported location to predict accidents," he said. "We can't legislate competence."

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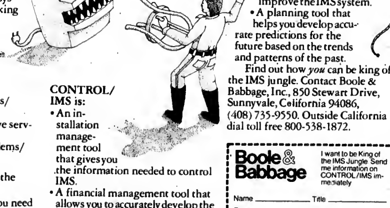

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Covers Both Public, Private Sectors

Germans Pass Privacy Law With Age Limit on Data

By G. Russell Pipe
Special to Computerworld

BONN, W. Germany — A Federal Data Protection Law was enacted here late last year that blocks the use of data if it is found to be inaccurate or more than five years old.

Of all 18 countries having privacy protection activities, only West Germany has made a special point to "end the life of data."

The law, which becomes effective Jan. 1, 1978, applies to both manual and automated personal data systems in the federal government, the Laender — or states — and all private enterprises.

Although the law contains most of the principles of fair information practices found in the U.S. Privacy Act of 1974, the Laender may exempt themselves from the federal law if they enact comparable state-level legislation.

Under the law, all collection, storage, transmission, modification and erasure of personal data is illegal unless organizations — governmental and private — comply with provisions of the act, have obtained authorization for their systems under another appropriate law or have secured the consent of the individuals whose records are maintained.

Affects Third Parties

Although the law goes into considerable detail and is a product of four years of compromise and modification, organizations maintaining personal record systems may find it difficult to be sure they are fully complying with the technical and organizational requirements.

Users of automated systems or those that process or divulge personal information to third parties must comply with all provisions of the act. Those keeping strictly manual files for internal use are required only to adopt appropriate security measures and prudent management procedures.

Like the U.S. Privacy Act, the German law requires public notice of the existence and character of systems, right of inspection and correction or erasure of erroneous information by data subjects.

Giving individuals the authority to inspect and correct records is a significant government precedent in the recordkeeping tradition of Germany.

Data processors have expressed concern over the law's technical and organizational requirements. These oblige users to prevent unauthorized physical access to the processing facilities; to establish controls over data linkage; to set up technical measures against improper input, access, communications, transport, organization and tampering with stored data; and to assure these practices will be observed by third-party processors.

In applying these regulations, the law suggests the "current state of the art and organization" should serve as an important source of guidance.

The government is authorized to issue orders, on approval of the upper house of the German parliament, the Bundesrat, representing the states, to adjust this section of the act.

Two significant loopholes are provided in the law, however: Protection shall be appropriate "to the type of personal data to be protected" and "measures shall be required only if the cost involved is reasonable in relation to the desired level of protection."

Penalties for violating the law involve fines of up to $20,000 and two years' imprisonment for some offenses.

An independent federal data protection commissioner, operating within the Ministry of Interior, will be appointed to ensure compliance with the law by all federal offices and establishments. Each of the Laender is expected to create a similar position and associations of private industries are to name ombudsmen to successfully implement the act.

All companies or associations that process data automatically and employ more than five persons for this purpose must appoint a reliable "data protection representative" with specialized knowledge who will report directly to the director or legally appointed manager of the organization.

Personal data brought into Germany from other countries and data transmitted abroad will be covered under the terms of the law. How to determine whether DP outside Germany is accorded necessary protection — especially in countries having no similar privacy legislation — may complicate the task of multinational processors and users.

The Federal Data Protection Law was hotly controversial at several stages of its three-year consideration, partly because of the type of rules which might be imposed on the private sector, the provisions for institutional supervision and the minimum requirements placed on the Laender.

An early political decision that a privacy statute precede enactment of a universal personal identification number for all Germans and resident aliens (favored by the highly automated Laender administrations) may have been a key incentive to the law's passage in the session of the German parliament which expired in December.

Pipe, presently an international consultant who spends most of his time in Europe, worked on draft versions of the U.S. Privacy Act as a congressional staff member.

Calendar

Feb. 22-24, Newark, Del. — **1977 Winter Meeting of the Association for the Development of Computer-Based Instructional Systems** (Adcis). Contact: Fred Hofstetter, Music Department, University of Delaware, Newark, Del. 19711.

Feb. 27-March 3, Houston — **DP Auditing Conference**, sponsored by the Bank Administration Institute (BAI). Contact: Jeffrey E. Kingan, The Meeting Services Division, BAI, P.O. Box 500, Park Ridge, Ill. 60068.

Feb. 28-March 2, Miami Beach, Fla. — **Advanced Data Communications Workshop**. Contact: Dorothy O'Connell, Systems Architects, Inc., Thomas Patton Drive, Randolph, Mass. 02368.

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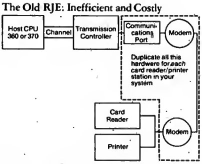

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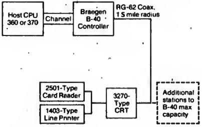

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BRAEGEN

Data Bank Being Tested to Help Diagnose Birth Defects

By Ann Dooley
Of the CW Staff

BOSTON — A data bank to help doctors around the world diagnose birth defects is currently being tested here.

Birth defects affect 15 million people in the U.S. alone and present a major health problem, according to the March of Dimes National Foundation, which is sponsoring and gathering information for the data bank in cooperation with MIT and the Tufts-New England Medical Center.

Some birth defects are so rare the typical physician will not encounter them in his lifetime. And the set of symptoms for one abnormality might be so similar to another that the physician would not know which to treat.

Statistics and symptoms of the 1,400 known kinds of birth defects are being fed into an IBM 370/168. When the data bank is implemented next spring, physicians will be able to dial into the computer from a hospital or office terminal at any time of the day or night.

A physician with a diagnostic problem will key the observed symptoms into the computer, and the system will narrow down the possibilities through a series of increasingly specific questions.

"The beauty of this process is that it compels the physician to examine areas which he may have missed," according to Sidney Gellis, chairman of the Tufts University Medical School's Pediatrics Department.

Questions and answers will continue until the system has received enough symptoms, signs and test results to suggest one or more probable diagnoses. At that point it is up to the doctor to decide what treatment to use.

"The purpose of the Birth Defects Information System is to assist the doctor, not to tell the doctor what to do. Only he can decide that," John Donovan said. Donovan is an associate professor at MIT's Sloan School of Management.

Once the symptoms are associated with a certain disease, the physician can identify hidden or extenuating problems that might occur. He can also predict the patient's health outlook and the risk that future siblings or offspring will be similarly affected.

An early warning system will also be an important part of the effort. Until now, doctors have had no knowledge of the kinds or frequency of birth defects diagnosed elsewhere.

Evidence will be available which will indicate the geographic areas, specific drugs, viruses or chemical contaminants which might be hazardous to a fetus.

With such a widely accessible centralized system, the drug thalidomide might have been recognized more quickly as a cause of birth defects, according to Louis Gutentag, technical assistant at the Sloan School.

Medical Data to Form 'Textbook'

DURHAM, N.C. — A data bank here will eventually be the most detailed and comprehensive source of information for physicians, according to doctors at Duke University Medical Center.

The "computerized textbook" stores diagnostic and treatment information so one patient's symptoms, treatment and response to treatment can be compared with thousands of other patients with similar case histories.

From this information, the doctor can make a more efficient and accurate judgment and decision on patient care, according to Dr. Robert Rosati, a Duke cardiologist.

This kind of medical record system differs from the normal "textbook" because information can be instantly retrieved.

The system is now on a Xerox Sigma 5, but will be converted to a Digital Equipment Corp. PDP-11/45 or 11/70 in September.

"The Sigma 5 wasn't bought to do what we're doing and couldn't handle the expansions we're planning," Rosati explained.

Input to the data base has concentrated mainly on heart problems so far; there are already 6,000 heart patient records processed.

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Lt. Col. J.B. Smith, Deputy Head, Education Research Computer Center, USAF Academy.
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Does More Than Tell Where to Drill

DP System Ensures All's Well at Amoco Oil Wells

By Ann Dooley
Of the CW Staff

TULSA, Okla. — Oil drilling is a high-pressured, costly operation in which computers are rapidly being implemented to avoid critical mistakes.

Amoco Production Co., the oil exploration arm of Standard Oil Company-Indiana, "drills more wells in the U.S. than any other company and has the highest success rate among the major oil companies," according to Bill Randall, research supervisor of drilling applications at Amoco.

Amoco analyzes where to drill for oil and gas using a system of five IBM 370/168s hooked together. Data comes from past drill jobs and existing wells.

But the computer's role doesn't end once the drilling sites are selected, Randall said. Drilling and rigging cost Amoco about $5,000 per day, so drillers depend on the computer to keep well drilling at optimum efficiency.

When something goes wrong or a change in drilling procedure is needed, oil drillers using portable terminals "call" Amoco's Honeywell 6600 in Cleveland via the General Electric time-sharing network.

For example, if changes in mud properties occur or adjustments are needed in rotary speed or mud pump pressures, the system will be asked to analyze the data and suggest alternative measures.

The system has resulted in savings that permit more wells to be drilled than would otherwise be possible.

Amoco has 35 computerized drilling assistance programs that provide data on equipment evaluation, well control and safety and the best, most efficient and cheapest ways to run a rig.

The programs indicate, for instance, what force and what drill to put on a rig. If a well starts to "blow out," the operator can obtain information on how to gain control of the well from indicators such as the depth and speed of the drill or the type of mud.

The assistance programs were developed from large data banks containing location and geologic formation data on more than a million wells, drill bit records on 130,000 bit runs, detailed cost information on approximately 5,000 wells and the daily drilling reports on 800 completed wells plus years of laboratory testing.

Amoco has licensed 53 other companies to use its program facilities. "The concept is still experimental and we get an exchange of information which eventually helps us cut drilling costs," Randall said.

Agency Uses Simulation to Find, Put Value on Undersea Oil Sites

By a CW Staff Writer

RESTON, Va. — There's only one way to produce oil and that's to make a hole in the ground, according to one oil driller.

But to determine where that hole should be drilled, oil companies and the U.S. Geological Survey put their money on the Monte Carlo simulation method.

The Survey's Geological Inquiries Group, whose responsibility it is to lease the ocean bottoms to oil companies, locates and evaluates the possible oil deposits based on seismic and geophysical readings, according to Gayle Oglesby, the group's chief of marine evaluation.

Once deposits have been located, the Survey uses the Monte Carlo simulation method to discover the probable production value of a tract of land and determine an acceptable bid price for a tract of ocean bottom, Oglesby explained.

Seismic Readings

Deposits are discovered by bouncing vibrations off the ocean bottom from a boat on the surface. The seismic readings received are recorded on a small on-board terminal, transferred to tape and then converted to an histographic printout which gives a three-dimensional picture of the earth's structure.

The type of soil structure shown on the printout gives clues on where oil and gas deposits might be located.

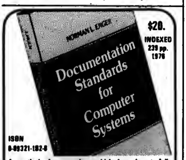
To determine a dollar amount for a tract, the computer, an IBM 370/155, has been programmed with 500 different variables. These variables are randomly selected on a run which is repeated 500 different ways, Oglesby said.

The Monte Carlo method, while not foolproof, has proven successful, he added.

Some oil men in Houston, however, call this approach "Swag" for "Scientific Wild-Ass Guess." The fact is, one oil man said, "nobody knows" where oil is located.

Nevertheless, the Survey believes this to be the most accurate method for determining fair market value when the oil companies come in with their proposed bids.

Oil companies like Amoco Production Co. use the same simulation method in determining the odds of producing oil in a tract at market value and obtaining a return on their investment.



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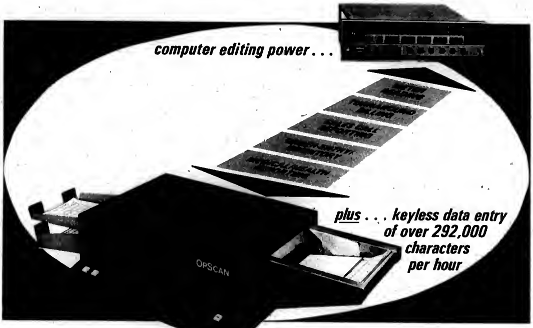
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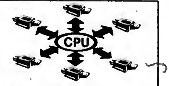

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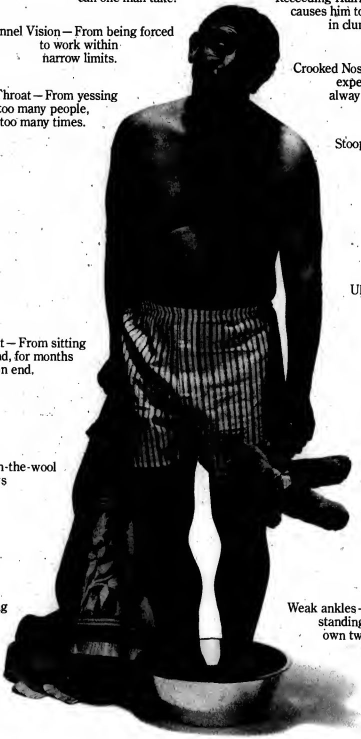

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(The Stifled Corporate Employee, 1977. As observed by ComputerAutomation.)

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Editorials

Deterring Disasters

A disaster such as the spill of millions of gallons of oil from the foundering Argo Merchant invariably leads to demands for stringent controls that will head off such catastrophes.

Several legislators have called for vessel traffic management systems that would monitor the progress of environmentally dangerous cargoes along the coastal waterways and at sea.

Much of the data in such a system would be computerized, and current sightings and observations would be compared to the expected positions of such vessels as recorded in a data base.

There have also been suggestions that records on "dangerous cargo violations" could easily be checked on vessels appearing to violate acceptable navigational practices.

Such vessel-tracking systems would be similar to the motor vehicle systems now in widespread use. Ships with questionable histories could be more easily identified and monitored. Perhaps potential disaster situations could also be identified and preventive actions taken.

In all of these proposed systems, the computer would provide the key link in supplying vital information and analyzing available data in a timely manner.

The introduction of DP would by no means assure the establishment of foolproof systems. But for those who understand its capabilities, the computer would provide an important tool as long as it is programmed in a logical manner.

Several government agencies are already using DP simulation techniques to predict the direction and impact of oil spills. This type of risk analysis has helped to anticipate the impact of these disasters.

The next step will be the use of the computer to prevent such events.

The computer can play a vital role as long as we don't ask for more than an intelligent machine can deliver.

Fair or Foul?

When do corporate actions and policies become detrimental and even damaging to an industry?

And how far can a dominant corporation go in attempting to obtain special considerations or exert undue influence?

These are, of course, difficult questions that may not have clear-cut answers. But attempts to deal with these questions have led to antitrust and other legal proceedings.

In a recent *N.Y. Times* article, William Safire traced the involvement of President Carter's designated appointees with IBM.

"Never in American political history has one corporation so completely dominated the top levels of any administration," Safire wrote.

"Is it wrong for a corporation to try to people an administration with its policymakers? Of course not — unless it gets too successful," he concluded.

But what is "too successful" and who will decide the threshold?

In the meantime, examples keep cropping up.

On Pages 3, 7 and 39 of this issue are some examples of these corporate practices that have come under scrutiny. These articles take on added significance in the light of recent events.

In this context, they deserve careful consideration because they affect all segments of the DP industry — vendors and users alike.

'It's All Yours.'

Letters to the Editor

Lord Should Consult the User Before Criticizing the System

I have read Kenniston Lord's articles in your excellent publication for many months. Each time I have emerged from the experience with the vague feeling that he was ignorant of his topic. However, I had to wait for his article in the Jan. 10 issue ["Must FAA System Standards Be Purchased With Blood?"] to be certain.

I appeal to you: Stop wasting good trees and ink on his ignorance.

As do most immature systems analyst/designers, he rushed into conclusions without understanding the problem or the proper role of the system he criticized.

To state things rather loosely, in the federal air traffic control system, control and decisions reside in the cockpit, not on the ground. Controllers (a misnomer, by the way) are "advisers"; they recommend and coordinate, they do not command.

When the entire computer-aided Federal Aviation Administration (FAA) goes down, there are still well understood and published procedures that both pilots and controllers know and follow. Their training is devoted to understanding those procedures (and their underlying logic) thoroughly.

While some hardship and delays may be imposed through, lack of computer support, no lives are placed in jeopardy.

Perhaps Lord should consult a user of the system before he criticizes it. This system works well although, like most, it could be improved.

Carol Anne Ogdin

Alexandria, Va.

Solution Rests in Real World

In his Dec. 27-Jan. 3 column, Alan Taylor asked for solutions to the problem of controlling unsolicited mailings of negotiable instruments to existing bank customers.

The solution is a simple one: Mail the material stamped with "address correction requested." When this service is requested, the U.S. Postal Service will forward the mail, if at all possible, and provide notification of the new address.

Yes, the solution requires sticking one's head outside of the DP world and finding out what is happening in the real world.

But, as Taylor would be the first to agree, DP does not exist in a vacuum.

Jerry Gitomer

Olney, Md.

Cobol Equivalent Corrected

In his letter [CW, Dec. 6], Larry Kintisch pointed out a mistake in M. Curtis Stordahl's article [CW, Nov. 15]. However, the solution he offered was incorrect.

Stordahl was attempting to convert PL/I's DO WHILE C to Cobol and incorrectly came up with PERFORM NEST-4 UNTIL C. This statement is the inverse of the PL/I structure.

Since the IF statement and the UNTIL clause have the same conditions, NEST-4 will never be executed. The IF statement will not allow the PERFORM to be executed unless NOT C is true, but then the PERFORM's UNTIL condition will be met and control will be passed to the next sentence.

The correct Cobol structure would be simply PERFORM NEST-4 UNTIL NOT C.

Sam C. Theis

Baton Rouge, La.

Data Past

Five Years Ago
Jan. 26, 1972

WASHINGTON, D.C. — Sen. Sam J. Ervin Jr. (D-N.C.), chairman of the Constitutional Rights Subcommittee, told Congress it had "an urgent duty to enact laws to control the rapid development of large interlinking computer data systems in the Federal Government which may affect the rights of citizens who deal with government."

In announcing the publication of the first volume of testimony taken by the subcommittee during its 1971 hearings on federal data banks, Ervin asked Congress to "enact laws to prevent future abuse of the Army's power to investigate law-abiding civilians" and called the testimony "an incriminating record of inequities in the executive branch of the Federal Government which have threatened the privacy and First Amendment rights of all Americans."

— — —

WALTHAM, Mass. — Honeywell Information Systems (HIS) introduced the Series 2000 line of medium-scale computers to complement its Series 200 family.

Eight Years Ago
Jan. 29, 1969

NEW YORK — The U.S. Justice Department filed an antitrust suit against IBM asking the Federal District Court here to "end IBM's monopolizing practices and to require any necessary divestiture."

The Justice Department asked that IBM be required to price, sell and lease separately its computer systems, programming know-how and other support.

Attorney General Ramsey Clark said the civil suit alleged that IBM pursued manufacturing and marketing policies that denied other manufacturers an adequate opportunity to compete effectively.

The last government antitrust suit against IBM ended in 1956 with the signing of a consent decree under which IBM set up its service bureau operations as a wholly owned subsidiary.

'Bionic Redemption' Can Return DP Power to the User

By Jack Stone

Special to Computerworld

"Bionics," according to *Webster's New World Dictionary*, is "the science of designing instruments or systems modeled after living organisms."

As I reflect on the state of the DP community at the start of the new year, I keep coming back to one thought: The human malaise that permeates computer centers can be attributed to the bionic or mechanistic character of much that happens in the centers.

It's a little late, but I suggest the community's resolution for 1977 be to redeem ourselves from our pagan, technological ways and redirect ourselves to the design and implementation of systems that are truly beneficial to the users, supported by trained and motivated personnel and managed by competent supervisors who build DP effectiveness through their leadership style.

Let me recount the "bionic litany":

Technical activity in the typical computer center is characterized by overweening fascination with the intricacies of the latest and greatest hardware/software configurations.

It appears almost irrelevant that meaningful systems are eventually derived from the technical establishment, seeming to interfere with the interminable debates over such minutiae as dating algorithms.

Negative Responses

Are our highly revered technical giants really turning out meaningful systems? I think the centers are doing a rotten job and I think this is the general opinion of most people associated with them.

In nearly all my DP management seminars and public lectures, I poll the audience. A typical question: "Do you judge your center to be doing a quality job in turning out systems that are really needed, properly implemented and cost-justified?"

I don't feel that question is particularly improper since it pertains to what is supposed to be the primary mission of the center, its "raison d'etre."

I've been polling this way for years and audiences have consistently answered with no more than a 5% to 10% "yes" vote, except for one recent occasion when 16% were positive in their response.

The Human Connection

It would appear the typical systems analyst/programmer/manager team perceives a DP system to be a flowchart, a Cobol source deck and a telephone call to production control to say, "It's coming across the counter."

'Bionic Redemption'

In contrast to that, "bionic redemption" implies significant efforts that must be applied to ensure human involvement in system development, including user participation from the project's inception; documentation of user needs and system specifications; and management controls over quality of technical work, budgets and schedules.

It would also include proper systems testing and user acceptance tasks; adequate briefings and run-time information for operations; and postinstallation audit review by management, including an analysis of the effectiveness and efficiency of the support personnel.

Another example of our dissolute ways is the near-total absence of installation-backed efforts to build human communications, leadership and management skills in the DP technical departments.

Where are the training programs that teach the technical people to be better people?

We are not given to eleemosynary pursuits, but people who can communicate better, who can demonstrate greater sensitivity toward their colleagues and user/customers, who can accept a self-directed drive for quality in their work will build better systems.

Certainly, the university establishment is not providing the training, as it is almost totally consumed with advancing the state of the electronic art.

In spite of the colossal complexities involved with computer center management, the university sector has virtually ignored the subject except for infrequent seminars in its extension institutes (and they are produced, in most cases, by commercial concerns).

In-house training of analysts and programmers is strictly limited to techniques and processes, and most operators consider themselves lucky to get a few minutes off to look at some videotapes on OS commands.

'Bionic Administrators'

The question that has produced the most negative response in my polling is: "Are your first-line supervisors doing the job that is required?" I have never received more than two "yes" votes in any of my audiences.

According to comments I have received as well as my own observations, first-line supervisory leadership (as opposed to administration) is essentially nonexistent.

The supervisor role is merely one that distributes the work, monitors performance, checks quality and sends up management reports with no particular concern about the human relationships involved in the effort or what it takes to get people to want to work more productively or why technical personnel are not committed to the organization.

Some people have referred to technical supervisors as "bionic administrators." Their lack of knowledge and/or concern for the human aspects of the job only gives them the appearance, but not the substance, of human managers.

The New Mood

Perhaps I am caught up with the new mood in Washington, slowly changing from scathing skepticism to human hopefulness.

In spite of serious questions about overall performance in our community, I believe the potential exists for computer people to find the time, the resources and, more than anything, the desire to apply their enormously creative talents to study and learn and to succeed in making the "human connection" to computer systems.

By analogy with the new Administration's desire to return the political power of the bureaucratic machinery to the people, a DP community movement toward "bionic redemption" will surely return computer power to the user.

DP Makes It Practical to Evade Information Controls

The Taylor Report

By

Alan Taylor, CDP

John, one of my brothers, is a doctor. I remember talking to him in the '50s about some of the problems that insurance investigators caused him.

At that time, John told me he was frequently approached by them in attempts to get access to the medical records of his patients — sufficiently frequently, in fact, for him to evolve a standard approach for handling them.

John's approach was quite simple. He refused to meet with them except during surgery hours. Then, when the surgery waiting room was full, he would invite the investigator in. The investigator would state who he was and who he was investigating. This would normally be done as quietly as possible.

John would pull the records from the cabinet behind his chair, silently check the time of the insurance application and the patient's death. Then he would rise to his full height, somewhat over six feet two, open the door, position himself in front of it and raise his voice so that everyone heard him.

He would proceed to explain the request that had been made and identify the investigator's employer. He would then come out with some statement like:

"And you, in order to avoid paying out an insurance policy, are trying to get me to hand over my records to you, just because you sometimes pay me to examine people before insurance is granted.

"Now you want my private records on one of my patients who you didn't have examined just so you can avoid paying out when the poor guy has died. You can go to hell!

"My patient's records are *private*, and XXX Insurance Corp. knows that all medical records are private and should stop this foul way of doing business — trying to avoid covering the very risks that they tout as being dangerous.

"Now get out — and don't come back!"

Needless to say, the people in the waiting room heard every word. And, needless to say, their medical records were safeguarded.

Technique of the '60s

In the '60s, the technique was to store computerized medical records from various areas: hospitals, local doctors, social workers, even from pharmacies. And opinions from court officers, school officials and so forth were added to the files.

The computer melded the information to provide some sort of profile — assuming that everything reported was true and that everything about the person was being reported by someone.

The output was supposed to yield recommendations that this person should be given birth control "advice," that person should be made a ward-of-state, etc.

Now, there is nothing wrong in suggesting the review of medical records or in computerizing them as such. But the key problem was that the firm concerned saw nothing wrong with using a real person's medical records gathered by various U.S. government agencies to illustrate how this could be done.

In fact, a whole community of patient records and the identification of the community and all the patients were there on display for days. And no one saw anything wrong with it.

The firm had never taken the Hippocratic Oath. To it, the records were magnetized shuts — not people, as they were to John.

Davis and Her Alibi

Now, in the '70s, the results of this failure to appreciate the problem of the computer have borne the expected, or easily anticipatable, fruit.

The recent National Bureau of Standards (NBS) report, "Computers, Health Records and Citizen's Rights," reported that medical records, for both proper and improper reasons, were being kept from the data subjects themselves — but not from just about anyone else.

Commenting on the report, Dr. Ruth Davis of the NBS claimed the problem of medical privacy had existed all the time and said computers "had simply made existing problems more conspicuous and irritating."

Well, that's nice. But it's really "exoneration by faint damning."

Sure, the problem of divulging medical data has been there for centuries; indeed, for over two thousand years the problem has been recognized. So far, Davis is correct.

What she failed to point out, however, is that not only was it recognized, but there were adequate controls on the situation. The Hippocratic Oath was, and still is, the major such control.

It was the existence of this oath that allowed John to publicly blast even insurance companies that paid for some examinations with impunity. They knew that if challenged they could not justify their approaches.

In the '50s, this control, while not complete, was adequate.

Computers Bypass Controls

What the computers have done — something Davis is pushing under the rug — is to bypass the controls that have been handling the problem fairly successfully for millenia.

The immediate computer crime is against the Hippocratic Oath control, not directly against the privacy of records themselves.

Computer systems, with their ability to copy and their inability to sort out reliable and necessary information from garbage and arrogance, have put these records into hands of those who hae not taken and do not care about the Hippocratic Oath or any other controls.

This computer-caused evasion of controls is more than just "conspicuous and irritating."

What Davis really seemed to be complaining about is the media's ability to bring the news of computer abuses to the masses, no matter who wants to bust them up.

Computers, in this case as in many others, have genuinely caused a problem that didn't exist before, but Davis ignored it. Computers have made it practical to routinely evade the medical privacy controls. That is what Davis so facilely and dangerously ignored.

Computer Alibis

Medicine, of course, is not the only area where computers are outflanking information controls. Bank records, for instnce, are open routinely to government officials now.

The direct authority for this action is an act of Congress. But if computers had not made it practical for such records to be easily reviewed, it is doubtful whether anyone would have thought of passing the law through Congress.

Credit records and scholastic records also suffer from the same erosion of confidentiality — not because some existing problem has become conspicuous or irritating, but because existing controls have been outflanked.

Davis should, of course, reconsider her comments (which really simply show offenders against various ethical actions an easy way to alibi themselves when caught).

More than that, DP professionals should not be taken in by the comfortable words she — or anyone else — uses.

Computer abuses are real and are caused by computers. Treacle words like Davis' comments won't cover these abuses, which need to be treated seriously if the computer revolution isn't to be followed by a burn-the-computer counterrevolution.

And I don't think even Davis wants that. I know I don't and I don't think the profession wants it either.

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Reader Commentary

Third-Party Switcher May Be Best EFT Net Service

By Gale N. Turner
Special to Computerworld

With the increasingly rapid growth of electronic funds transfer (EFT), the question looming is how best to implement network switching, whether through federal or private facilities.

A service organization or consortium may be the answer.

It has been suggested that the automated clearinghouse (ACH) network and an integrated national point-of-sale (POS) system are "natural monopolies" because of implied economies of scale.

If this can indeed be proven as a Keynesian axiom, then let us quickly default to the Federal Government and proceed with other levels of development. One need only give a sideways glance at a mailbox, however, to be reminded of the massive bureaucracy required.

Adapso Position

The Association of Data Processing Service Organizations (Adapso) maintains that federal agencies should be prevented from entering into three elements of EFT — entry, delivery or processing — until the private sector has an opportunity to foster such systems in a competitive environment with minimal government intervention or regulation.

Adapso has long supported a "maximum separation doctrine" which prevents the improper spillover of power from one market to another. If any federal agency operates an EFT network, the private sector of the DP service industry will, accordingly, be precluded from competing.

The private sector has the present ability to create and operate competitive EFT systems in a manner consistent with the public's interest in privacy, security and economy.

The real question in this issue is whether the financial intermediaries are willing to operate with a set of standards which places the Federal Government or the Federal Reserve Bank squarely between them and their customers. I doubt that will happen.

A possible solution to this dilemma is for the regulatory officials, in conjunction with ACH members, to seek out, on a bid basis, the neutrality and efficiency of a service organization or consortium thereof for the network switching.

This would tend to place the Federal Reserve's administered ACHs and the private ones on a more common ground.

Successful Networks

Successful applications of transaction networks have included service organizations such as AT&T's Transaction Network Service, Dial Financial Corp.'s switching network for Iowa Banks, Texas Instruments' money transfer system, Credit Systems, Inc.'s switching network for St. Louis and contiguous states and National Data Corp.'s credit switching network.

The service organization could also provide EFT services to small financial institutions which, by lack of size and scope of operations, do not have the ability to offer these services to their customers. As geographic boundaries continue to melt away, this area will be of increasing concern to bank regulatory officials, not to mention the banks affected.

Let us hope the regulatory officials provide a wholesome arena of competitive restraint. This may require the wisdom of a Solomon.

Service development of a new form is currently taking place at the corporate level as treasurers discover better ways to employ cash management techniques through bank balance reporting. In essence, a complete cash control system would be at one's fingertips.

This service best demonstrates two inherent traits of the third party. Users benefit by the efficiency in receiving a consolidated report. Neutrality is maintained by a noninterested party handling sensitive banking information and economies of scale are at work to keep costs low.

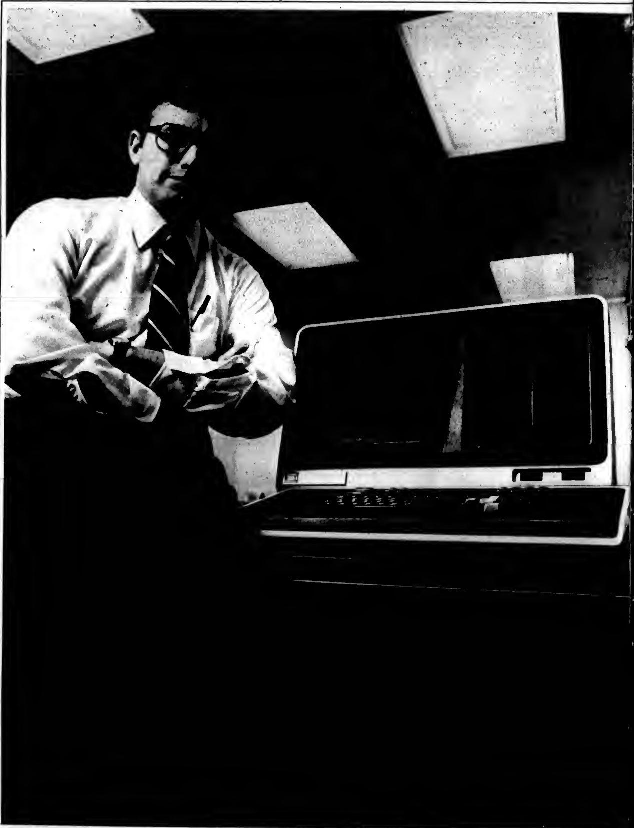
Service organizations offering balance reporting now include National Data Corp., General Electric, Rapidata and Automatic Data Processing.

At the consumer level, POS or check guarantee networks have been established by Control Data Corp. (Telemoney), TRW, American Express and National Data as well as several private-label credit card issuers.

Third-party service organizations have been an integral part of the nation's financial community. As the need for specialization increases in the EFT arena, third-party services will be increasingly required.

We, as others, look to the legislative and regulatory officials for setting the electronic climate of the future. All we ask and expect is the opportunity to compete under the concept of free enterprise that has made this nation great.

Turner is manager of bank services at National Data Corp. in Atlanta.



Computer Science Grads Face Dilemma

DP Industry's Youth No Excuse for Its Hiring Practices

By Andrew Robinson
Special to Computerworld

Reader Commentary

I am currently employed as an IBM computer operator with the option of promotion to a position as an applications programmer.

I wish to remain a computer operator — but not lose the financial gains afforded an applications programmer. What should I do?

Neither lacking in ambition nor the competency to learn a new skill, I am currently an undergraduate computer science major studying systems programming at the University of California at Los Angeles. For this reason, my interest in computer operations stems from a desire to work as closely as possible to the operating system.

When I inquired at other companies about openings for computer operators, however, I found these positions available only to those being promoted from within. Many companies are inclined to promote non-DP people — such as mailroom clerks or truckdrivers — to junior computer operator positions.

I have no objections to hiring entry-level people (those with no DP training) to DP positions. However, many companies will only take on new employees who have years of experience on their particular systems.

This means that if someone with three years' experience as an RCA Spectra 70 computer operator applied for a job requiring three years' experience as an IBM 370/155 computer operator, he would not get the job.

By virtue of "seniority" within a company, however, someone with no DP training could be promoted to that position.

To me, this illustrates that hiring practices in the DP industry have not kept pace with DP technology.

The following are just a few of the personnel practices in the industry:

- No university teaches actual "computer operations" sufficient enough to award an individual certification comparable to industry requirements.

As a result, a student could obtain a degree in computer science and be considered a professional without ever having IPLed a system, witnessed a disk head crash or seen a hard-copy log.

- In DP departments, many computer operators with no programming training are promoted to applications programmers. However, many an aspiring university student of computer science familiar with all the languages has been denied these opportunities because he lacks "actual programming experience."

'Dumb Operators'

- Many programmers and systems analysts look down on operations staffs as "dumb operators."

But when the system crashes, competent operators are second only to system programmers in value.

- Many average computer operators have become DP managers and systems analysts while senior computer operator "diehards," devoted to their occupation, have been suppressed in salary and dignity and suffered the browbeating of the systems programmer.
- An average computer operator can be promoted to be a junior systems programmer, yet a person with a bachelor of science degree in computer science can not get a job as a junior systems programmer without at least two or three years experience "doing only that."
- Many service bureaus and data centers require an individual to fill roles as diverse as keypunch operator and system analyst, yet they maintain fixed salary ranges and exercise a reluctance to compensate for overtime.
- Those of us cast by fate to temporarily assume non-DP occupations to resume studies, acquire more income, etc., are ostracized when we attempt to get back on the DP bandwagon because of "no recent experience."

To attempt to cite all the inconsistencies of our profession would require the compiling of a tome, which I shall not attempt. My desire is only to bring to light some of the practices with which we in DP are constantly faced and to elicit a solution.

To say that our profession is too new to have dynamic and equitable personnel practices, affording just compensation for just performance, is about as illogical as our persistence in supporting second-generation keypunch cards on fourth-generation systems.

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Jack Robinson, Asst. VP
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Why Would a DPer Ever Give Up His Vacation Rights?

By Miles Benson
Special to Computerworld

The Sociology of Computing

If you've ever worked on a payroll program (and you must have, because statistics show there are more payroll programs in existence than programmers), you know that payroll programs collect all kinds of wondrous data.

Not just the hours worked and pay rate, figured by the week and year-to-date. That's for classroom exercises. Not even just Social Security and all the other deductions thrown in.

A real, healthy, functioning payroll program also keeps track of sick leave and credit union balance and vacation and . . .

I could go on, but I won't. Vacation is what I want to talk about.

There's something I just plain don't understand about vacation time. It's a sociological phenomenon, and I don't know what to make of it. Let me explain.

Last month I had to write a program to prepare a special report. It happens every year, but this year *I* got the short straw. The report was a summary of unused vacation time. By employee.

No sweat, right? Access the payroll data base, tally the vacation hours used, subtract from the eligible hours for that employee. Software at its simplest.

Well, it's not the program that bothers me. It's the report. I snuck a look before I turned it over to management. And what I saw is what I don't understand.

For instance, there's Brian Dudley, who has 160 hours of unused vacation time. That's 20 days. And there's Sam Stirpes, with 216 hours — 27 days. And worst of all, from the point of view of my confusion, is Clifford Lancer, who has 248 hours. That's 31 days. And there were 53 other computer types in the same boat.

Now, there are a couple of reasons why I don't understand this. For one, the company cuts you off at 120 hours. I mean, if you have any unused vacation time past 120 and you don't use it up the following year, it goes away. So why does anyone get into a position where he'll simply give away his vacation rights?

The second reason I don't understand is that I know these guys. I mean, Brian Dudley is a programmer, a 40-hour-a-week grunt like me, and he doesn't owe the company a thing. Why should he give his vacation away?

And Sam Stirpes? Well, he's a dedicated family man — six kids at home, nice kids, all of them reasons why I'd think he'd want to be home every chance he got. Sure, he loves designing complex test cases in his product test job, but he can't love it that much, can he?

And Clifford Lancer may be a first-line manager, and he does work long hours, but wouldn't his value to the company increase if he'd refuel himself periodically with some vacation?

So there's my confusion. Why would otherwise sane people throw away one of the fringe benefits of their job for no apparent reason?

The Scarey Part

Well, I'm not one to let confusion grow under my feet. I asked Brian and Sam and Clifford why they did it. And here's the scarey part.

They didn't really know, either.

Oh, they mumbled some things about schedules and deadlines and pressures and falling behind. But I don't buy it. There has to be a better reason.

I mean, how many people are so concerned about the company's books that they'll sacrifice themselves to help keep them balanced?

So I've fantasized a reason. Good healthy fantasies are a nice pastime when turnaround is bad and your job's in checkout. Like now. Let me share my fantasy with you.

Suppose the company really does want to milk the most time out of its employees, even to the point of getting them to sacrifice their vacation time. Suppose, in other words, that corporate management has a plot to subtly coerce its employees into donating their vacation time to the cause.

Paranoia, right?

But let's go further. How subtly is subtly? I mean, these guys are smart. If the company were overtly screwing them, they'd know it.

But what if the cause and the effect were well separated? What if, for instance, the company deliberately signed contracts with impossibly tight schedules? And what if it didn't tell anyone it had?

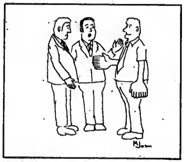
Then responsible, hard-working guys like Brian and Sam and Clifford would work their tails off to make those schedules come out right. And probably if they didn't make it, they'd blame themselves, not the company.

If their own sense of responsibility didn't get them, peer pressure would. I mean, who can refuse to sacrifice when all about you are?

Well, as I said, it's a fantasy. A paranoid fantasy. Probably the real truth is that the company is conducting a secret "Failure to Take Vacation Sweepstakes," and the information was leaked to a few key employees so they could get a head start. Now, there's an explanation you could build a *real* fantasy on.

I mean, a malevolent company? That's just too paranoid to believe.

Isn't it?



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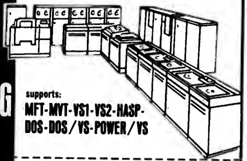

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CONRAC CORPORATION

Training Budget Gone

Consortium Approach Provides Free In-House Course

By **Don Leavitt**
Of the CW Staff

WORCESTER, Mass. — When times get tough and DP budgets are slashed, training dollars are often the first to go.

When that happens just as a DP department is considering a move to new programming techniques, the result may be a delay of the move or a disappointing half-hearted training effort.

But delay and disappointment aren't necessarily part of the scene, even if the training budget has been completely zeroed out.

That's what the DP staff of a manufacturing firm here discovered during the most recent recession. Under a plan that can be used in other metropolitan areas, Norton Co. was, in fact, able to get the training it needed for its people free.

At the same time, the plan provided other firms in the area the change to gain the same training at a set fee without the added cost of getting people to and from a distant training center and keeping them there.

It happened this way. In 1975, Norton was on the verge of deciding how and when to implement structured design and programming techniques when economic realities wiped out the training budget.

The budget was gone, but the problem remained: the company had to train a number of system development supervisors to make the right decisions.

Looking for ways to solve the dilemma, Kate Oliver, then Norton's DP training coordinator, talked to Brandon Systems Institute, Inc. (BSI), a Maryland-based organization that presents seminars, both "public" and in-house, across the country. The talks led to action.

About two months later, Dr. Ned Chapin presented BSI's two-day course on the management of structured design and programming to Norton's supervisors at Norton's offices — at no cost to Norton.

To make this happen, Norton spent the two months before the course setting up a training consortium.

Basic Fee for Training

The basic fee for BSI in-house training, which covers up to 25 students, is eight times the standard BSI public course registration fee plus instructor out-of-pocket expenses for travel and subsistence during the training assignment.

Therefore, Norton's goal was to find nine outsiders in the Boston-Worcester area who needed the same training it wanted.

If Norton charged the nine outsiders the standard BSI public registration fee, Norton could then fill the remaining 16 seats in the course with its own people, at no cost to the company.

BSI was able to help. It maintains mailing lists of DP managers and training directors, so it ran the list for the Boston-Worcester area and gave the names to Norton.

The Human Connection

It also gave Oliver a list of organizations in the area that had recently asked BSI about its structured design and programming courses.

Fortunately, Norton was also an active member of a local group of DP training coordinators which had recently negotiated a multicustomer contract with a national vendor of audio-visual training.

This group was a natural "captive audience" for the consortium approach.

Morton announced the planned presentation to the DP community. In a letter sent out to all the DP installations in the area, Oliver included a brief outline of the course, a professional resume for Chapin and an overview of the benefits of taking part in the consortium.

The results . . . Norton got its nine outsiders.

Since the Norton operation in May of 1975, BSI has helped organize over 40 consortium presentations across the country and in Canada and Europe.

The experience of early sponsors has been distilled and is presented in a "how to" guide provided by BSI as a free service to DP managers and training coordinators.

The *BSI Consortium Sponsor's Guide* contains recommended letter formats for announcing the consortium to the DP community, sample course outlines and professional resumes, survey formats to ascertain the training requirement of neighboring DP organizations and a checklist of steps and hints to organize a successful consortium.

The guide also gives specific tips on details that can make or break a consortium effort.

It discusses, for example, how a sponsor can arrange for the invoicing and collection of outsider course fees with its own accounting department and how to lessen the risk and ensure smooth handling of the money.

This can be a critical part of the plan, a BSI spokesman noted, since the sponsoring organization is legally responsible to BSI for payment of the course fee.

The special services and consultation provided by BSI help ensure the success of the BSI consortium for the sponsor, the spokesman asserted. However, the spokesman added, there is no reason the basic approach cannot be used to announce and conduct non-BSI courses as well.

BSI is at 4720 Montgomery Lane, Bethesda, Md. 20014.

Honeywell Upgrades Level 6 Software

BILLERICA, Mass. — Multitasking, communications, sorting, indexed sequential files and enhanced languages are among facilities that will be available to users of the Honeywell Series 60 Level 6 minicomputers by mid-year, according to the vendor.

The updated operating system and other software were introduced when the company announced expansions to the Level 6 mini line recently [CW, Jan. 17].

However, it can be used on any Level 6 CPU with at least 32K memory, a spokeswoman added.

The Multi-Dimensional Tasking operating system (GCOS6/MDT) allows one or more real-time or communications tasks to run concurrently with a single batch job.

The third operating system introduced for the Level 6 family, GCOS6/MDT is said to be upward compatible with the capabilities of the earlier ones.

Language, Communications Support

A pair of control languages are included in the operating system to provide for dynamic system reconfiguration and loading of an application program.

The user's Execution Control Language (ECL) must be used with batch and program development streams when real-time work is being handled concurrently, Honeywell added.

Communications support includes the ability to transmit files between Level 6 and Level 66 systems, to use teletypewriters or Honeywell CRTs and to work with binary synchronous protocol, the spokeswoman noted.

Within the system software, support for Isam files will be added to the sequential and direct file management modes already provided under earlier operating systems.

License to use the GCOS6/MDT executive is available for a one-time fee of $800.

A license to use the new operating system and the basic program development tools — the assembler, linker and editor — is available for $1,600.

Sort capabilities for both GCOS6/MDT and the earlier BES/2 environment will be available to users as options, carrying their own price tags. Though the sorts are packaged separately for each environment, they will cost $200 each.

Language capabilities will include an RPG for Level 6, described as "generally compatible" with RPGs and RPG-IIs for other small systems, the ANS Cobol-'74 compiler and Basic Interpreter announced in the fall, enhanced Fortran and Assembler.

Fortran extensions are intended to utilize the floating point processor on the newly announced 6/43 mini, the spokeswoman added.

RPG will be available for a license fee of $2,200, while Cobol costs $2,750; Fortran, $600; and Basic $50.

Honeywell Information Systems is headquartered at 200 Smith St., Waltham, Mass. 02154.

Package Reformats Cobol Code

WEST TRENTON, N.J. — The Cobol Source Reformatter (CSR) package from Generated Systems, Inc. (GSI) supports features such as level number indentation, PICTURE and clause alignment, keyword recognition and nested IF/ELSE logic indentation, according to the vendor.

Centering and boxing of comments, highlighting of division and section headers, paragraph spacing and line sequencing and identification are other options, GSI added.

The degree to whcih any of these options is used in a particular reformatting run is determined by user-selected parameters.

These may cover such things as number of lines left blank between paragraphs or the number of columns indented for a continuation line or an ELSE related to a previous IF.

The formatter, written in ANS Cobol, can be used as a stand-alone utility, in which it might serve to highlight an inadvertent gap in a programmer's logic, or as a preprocessing step in the basic compilation process, a spokesman explained.

CSR is available as a package, requiring about 150K bytes of memory, and is implementable on almost any mainframe that supports ANS Cobol.

It costs $500, with maintenance after the first month available for $100/yr.

The capabilities of the formatter are also available on a service basis through GSI.

This might be useful to an installation interested in testing the package before acquiring it for in-house use or as a means of getting the reformatting done without tying up the user's own system, GSI suggested.

GSI is at 140 Scotch Road, West Trenton, N.J. 08628.

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Useful by Itself

Data Dictionary Built for IDMS

WELLESLEY, Mass. — The Integrated Data Dictionary (IDD) developed by Cullinane Corp. as a logical extension of the company's Integrated Data Base Management System (IDMS) should be ready for general release by mid-February, according to a spokesman.

Despite its basic design goal of enhancing IDMS operations, IDD can be used by installations with other data base management systems already installed or being considered, Cullinane said.

In common with other dictionary packages, IDD creates a central repository of information about the using installation's data assets, regardless of file type, storage mode or processing method.

A Data Dictionary Definition Language (DDDL), "English-like, free-form and programming language independent," is a key component of IDD, Cullinane noted.

There is also an "active" interface with IDMS' Cobol and PL/I processors, the spokesman added.

Range of Facilities Provided

The degree of integration of IDD and IDMS provides users with a range of facilities, including documentation through the data dictionary file and data privacy through subschema restrictions, he said.

IDD users also have automatic recovery and data integrity through IDMS utilities, and use of the dictionary without waiting for batch operations through Culllinane's On-Line Query system, the vendor added.

The word "active" is very appropriate in describing IDD's linkage to Cobol and PL/I programming efforts, the spokesman said, explaining that as programs are compiled, IDD "automatically" captures the new logic's effect on all data elements.

This is true whether a program is using a data base or standard files in its processing, he noted.

IDMS users can acquire IDD for $12,500; others can have it for $15,000, the company said from Wellesley Office Park, 20 William St., Wellesley, Mass. 02181.

RSTS/E Users Offered 'Fsort'

LEXINGTON, Mass. — A sort now available from Evans, Griffiths & Hart, Inc. (EGH) is said to handle key files faster under Digital Equipment Corp.'s RSTS/E time-sharing system than PDP-11 users can get under DEC's own sort capabilities.

The machine language-coded package, called Fsort, is primarily intended to serve as a compatible replacement for the Basic-Plus coded Sqwik and Mqwik modules from DEC's RSTS-11 sort system.

While compatible, the in-core sort can, under certain circumstances, handle more keys than the DEC software, EGH claimed.

Measurable Improvement

Fsort's developers claimed to have measured stand-alone wall-clock time improvements of between eight and 30 times over the comparable components of the DEC sort. They also claimed CPU time reductions of "about 96%."

The variability in wall-clock time improvements is attributed to a number of factors, including the sort job core size, the ratio of CPU speed to disk access speed and even the nature of the particular key files involved, according to a spokesman.

Although the key file and calling conventions within Fsort are compatible with the RSTS sort, the utility can be used independently of that software with "suitably programmed user interfaces," he said.

Used in such an independent mode, Fsort can be used to sort up to 65K keys, or twice as many as is possible with DEC software, the spokesman added.

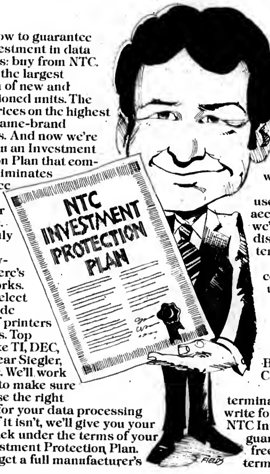
The heart of Fsort is a 2K run time system which is installed under RSTS/E, version 6A and later versions and used with in-core sort areas as small as 5K words or as large as 28K, depending on the system and conditions under which it is run.

The license fee of $2,500 includes the first year warranty and updates, EGH said from 1844 Massachusetts Ave., Lexington, Mass. 02173.

Correction

The Fasnet distributed data network service now available from University Computing Co. (UCC) [CW, Jan. 10], allows local access to UCC's multiple Fasbac systems from more than 60, not six, cities in the U.S. and Canada, a spokeswoman noted from the vendor's headquarters in Dallas.

Only terminals from NTC come with a free insurance policy.



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Quantity, Quality Improvements Highlight Latest DP Bibliography

More than 225 new books are listed in the 10th edition of the *Annual Bibliogrophy of Computer-Oriented Books*, published this month by the University of Colorado.

Notable in this year's listing is the increase in quantity *ond* quality of books on the subjects of system design and program design. In addition, the number of books on data communications increased by 50%.

J. Daniel Couger On Education

All books prior to 1971 were deleted, except for a few classics like James Emery's *Cost/Benefit Analysis of Information Systems.* Despite the deletions, the bibliography still contains more than 1,000 books from 210 publishers.

The bibliography separates books into 55 categories and catalogs them according to type (reference, textbook, handbook) and style of presentation (programmed instruction, case study or narrative discussion).

A new category on program design was added this year because of the increase of books on this subject. Ten new books were published in this category, including *Software Tools* by Kernighan and Plauger. *Software Reliability Principles and Proctices* by Glen Meyers is another example of the improvement of books in this category.

Data Base Books

The most significant improvement in quality of books is in the system design category. John Lyon's *Dotobase Administrator* is an example. There are now 29 books on data base.

The data communications section contains eight new entries, including James Martin's latest, *Telecommunications and the Computer.*

Another valuable addition to the system design section is *Integrity and Recovery in Computer Systems* by T.K. Gibbons.

Ten books were added in the system analysis category. The section on computer applications was expanded by 28 entries. An important addition in that category is *Computer Audit and Control*, a 489-page tome by Mair, Davis and Woods.

Advanced Programming Area

Continuing the trend of the past two years, the additions to the advanced programming area evidenced considerable improvement. Twelve new books were publsihed, including David Hsiao's *System Programming: Concepts of Operating and Data Base Systems.* Another classic was published: Edsger Dijkstra's *A Discipline of Progromming.*

Until 1974, few good books were available for the specialized area of DP management. That section was enhanced in 1976 by such publications as *Guide to Successful Computer System Selection* by Kearney and Mitutinovich. There are now three books on performance measurement.

The computer reference section lists the handbooks that should be a part of the computer library of every organization.

The flood of programming textbooks has diminished to a trickle in several categories. Only two RPG and two PL/I books were published last year. However, nine new books on Cobol and four on APL were released.

A noticeable difference occurred in the design of many of the new programming books — they are oriented toward structured programming. It is now possible to find a structured programming book in every major programming language: PL/I, Cobol, Fortran, Algol and APL. Previously, structured programming was confined to books on PL/I.

Copies of the bibliography are available for $4 from *Computing Newsletter*, Box 7345, Colorado Springs, Colo. 80933. The cost is $5 if an invoice is required.

Couger is professor of computer ond management science ot the University of Colorado.

VS Concepts Taught In-House

McLEAN, Va. — Application programmers and systems analysts in IBM-based installations can gain the education they need to take advantage of VS with a modular course called "Program Design for VS," according to the developer-vendor, JRB Associates, Inc.

The course, designed for in-house use, explains the concepts and mechanisms of VS programming and — "more importantly," a spokesman added — presents and describes effective design and coding strategies and guidelines.

The course "package" includes an initial two-day class taught at the user site by a JRB instructor; course materials; and duplication rights to the materials.

The course materials are modularized into 16 topics to simplify course tailoring and preparation work by the in-house instructor.

The instructor's guide for each module states the module's objective and suggested timing. It also contains an outline of the material, explanations of the visuals and a detailed list of references and resources, the vendor added.

The package is available for $3,900 plus the cost of travel and accommodation of the JRB instructor. Scheduling is subject to negotiation, the firm noted from 8400 Westpark Drive, McLean, Va. 22101.

Release of 'Splice' Aligns IF/ELSE Code

SACRAMENTO, Calif. — Responding to an increased interest in structured programming, Software Module Marketing (SMM) has modified Splice, its Cobol preprocessor, to include IF/ELSE alignment as part of its basic function.

With the enhancement, Splice will realign Cobol programs so the ELSE appears under the relevant IF according to compiler rather than programmer interpretation.

In addition, nested IFs are successively indented by four columns, and all detail lines are indented four columns from the appropriate IF or ELSE, the vendor said.

A permanent license is available for $5,000; monthly rental and lease/"purchase" terms are also available, the firm said from Crocker Bank Building/Penthouse, 1007 Seventh St., Sacramento, Calif. 95814.

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THE U.S. COMPUTER INDUSTRY: A Study of Market Power
by G. W. Brock
Pub. price, $15.00
Club price, $12.50

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Pub. price, $19.50
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A Programmer's Education

'Homemade' Monitor Puts 360/40 Data Entry On-Line

By Norman E. Bollinger
Special to Computerworld

Concepts and Techniques

"Nobody around here needs an on-line system. Besides it would cost too much anyway." Classic complaints, but what were the facts for us at the Board of Education for Baltimore County in late 1975?

Could we put our new personnel system on-line to a batch-oriented IBM 360/40 running under DOS?

With an 80K partition available and the dirt-cheap cost of local IBM 3270 CRTs — rental came to $1.35/hour based on a seven-hour day — the only thing that stood in our way was software. So we took a look at what was available.

Two local installations had developed their own on-line monitors and we looked at them and at packages that were on the market.

None of them really fit together with our data base package and some of them would require more than 80K. So, back to the software problem.

We had Cincom Systems, Inc.'s Total data base management system, which was ideal for online updating — but we didn't have the time-sharing and terminal software to make it work in 80K.

At worst, we could start with one of the homebuilts and enhance it to meet our needs.

As it turned out, the homebuilt monitor had no comments in the assembly coding and it was a bear to put data on the screen.

Could we do any better?

Over the years I had accumulated a good knowledge of DOS assembly techniques, but missing were two large undeveloped components for the online design. The first was recovery of data bases and CRTs and the second was the CRT I/O.

I proceeded to develop a time-sharing system with secret user codes and a menu of user programs. Within one month, this was coded and tested on the IBM 1052 console. That was very encouraging.

Biggest Problem

The biggest problem was the CRT I/O. A CRT operator could modify any, none or all of the modifiable fields on the screen. But how does the host program know which ones were modified?

Since the CRT knew that information, it was easy to pass back a list of the relative fields that were modified. Then a Cobol program could use a GO TO . . . DEPENDING ON statement to process the changes.

That was beautiful for programmers. Also, there is no need to store screen formats. The application program in the 360/40 owns the screen format and easily uses the 3270 field features.

With CRT I/O out of the way, the next tough problem was data base recovery. It was easy to checkpoint the system and restart with the last screen image, but what about recovery?

Most systems do some kind of transaction logging which is programmer dependent, but the 3270 was not transaction-oriented. That would be extra work for the programmer to format the screen into a transaction.

Then I found another Total user was logging the contents of a successful update call.

That was it — a new generation of on-line recovery technology. We wouldn't need a complex transaction reprocessor — just a simple program to repeat the data base updates in a matter of a few minutes. That was beautiful and programmer independent.

After a year of operation, our decision to build our own on-line software is still a good one. It was an economical decision; the development time was only four man-months which meant it was cost-competitive to those packages available.

The system came up on time and was very easy for the programmers to learn. We have never had to recover a data base for any reason.

The neatest touch of all is "new user CRT training," which is done on the CRT itself, based on a computer-assisted instruction course that teaches all of the 3270 features and keys in 25 minutes.

We're handling as many as 20,000 CRT operations in a six-hour day.

Now, everybody around here wants their systems on-line.

Bollinger is a programmer analyst with the Board of Education of Baltimore County, Md.

Scobol Builds on Jackson's Principles

By Martha J. Cichelli
Special to Computerworld

James L. Tucker's article, "'Locally Chaotic' Modular Code Showed No Structure" [CW, Jan. 10], was a clear and well-written description of what is the obvious algorithm for processing a sequential file.

He mentioned Michael Jackson's excellent book, *Principles af Program Design* (Academic Press, 1975). This book is must reading for all professional programmers who use Cobol. Jackson used a pseudocode notation to extend and clarify Cobol for presenting business DP algorithms.

In 1973, Lars Mossberg of Volvo Flygmotor AB in Sweden attended one of Jackson's European seminars. He quickly became convinced that the pseudocode was so suited for writing programs in Cobol that the process of translation from pseudocode to standard Cobol should be automated.

Mossberg's precompiler, Scobol, spread from Volvo and is now being used in forward-looking programming shops in Europe and the U.S.

Scobol implements Jackson's fully nestable IF-THEN-ELSE-ENDIF, WHILE-DO-ENDDO, REPEAT-UNTIL, ITERATE-UNTIL, SELECT CASE-ENDCASE, POSIT-ADMIT-ENDPOSIT and the QUIT BLOCK statement.

The sequential file processing routine in Scobol would read:

```
PERFORM READ-TRANSACTION
WHILE (MORE-TRANSACTIONS) DO
   IF(TRANSACTION-CODE-IS-VALID)
   THEN
      PERFORM-PRINT-TRANSACTION
   ELSE
      PERFORM PRINT-ERROR
   ENDIF
   PERFORM READ-TRANSACTION
ENDDO
```

The Scobol code can make even well-structured Cobol code (which Tucker's certainly is) look awkward by comparison.

Cichelli is with Software Consulting Services in Allentown, Pa.

Seminars Cover Long-Term Plans

ROCKVILLE, Md.— Keston Associates will present a series of four-day workshops on "How to Develop an Effective Long-Range Data Processing Plan" in the Washington, D.C., area March 14-17 and May 16-19 and in San Francisco April 4-7 and June 6-9.

Workshop Objective

The objective of the workshop will be to establish a viable planning mechanism as a means of controlling the DP function, Keston explained. A workable set of planning methods and procedures will be presented.

Specific material covered will include a technique for the projection of future user requirements, a mechanism for mediating between competing user priorities and a procedure for estimating impending hardware, software and personnel needs, Keston added.

The registration fee is $495; further information is available from Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

Rapidata Lowers Rates

FAIRFIELD, N.J. — Rapidata, Inc. has announced revisions in processing charges for large-scale jobs using the company's Background-10 system.

The revised rates provide an incentive for customers to run applications requiring more than 30K of core during nonprime time by offering discounts of up to 83% on weekends and 72% on weekday evenings, a spokesman claimed.

Nonprime-time hours are between 5:30 p.m. and 8 a.m. the following day.

'Spare-Time' Basis

Background-10 processing allows jobs to be run on a low-priority, "spare-time" basis without the user remaining online. Users can specify the date and time jobs should run.

Background-10 is a "natural" for batch processing applications when used with archive storage and Rapidlink, Rapidata's software interface for communications between its system and a user's in-house computer, the spokesman added from 20 New Dutch Lane, Fairfield, N.J. 07006.

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Data Briefs

UL Publishes Standard For ATM Manufacturers

CHICAGO — Underwriters Laboratories, Inc. (UL) has released the first edition of its standard for automated teller machines (ATM), UL 291.

The UL requirements apply to the construction and security of equipment intended to automatically dispense currency when properly operated by an authorized customer and were designed to provide protection against unauthorized removal of currency.

In the publication, UL also set forth standards for the protection of deposits made by customers and protection against unauthorized manipulation or removal of the records that would prevent the proper debiting for the currency dispensed.

The requirements cover electrical, mechanical and structural design of the terminals and accessory equipment.

As of September, four vendors of automated tellers had machines which were UL-approved: Burroughs, Diebold, IBM and NCR, according to a UL spokesman.

The 43-page publication, "Standard for Automated Teller Systems," intended for manufacturers, costs $3.50 per copy or $9 for the booklet and a subscription service to any revisions issued, he said.

Requests for copies should be sent to the attention of the Publication Stock Department, UL, 333 Pfingsten Road, Northbrook, Ill. 60062.

Tandberg Cartridge Recorder Gets Controller Interface

SAN DIEGO — Tandberg Data, Inc. has added a microprocessor-based RS-232 communications controller interface for its TDC 3000 digital cartridge recorder.

The controller is contained on one printed circuit board which mounts inside the recorder. It can be programmed for special requirements such as communications protocol generation and format checking and features selectable parity options and transmission rates, according to Tandberg.

The controller operates in half- or full-duplex modes; routines for detecting and correcting data errors reportedly are standard.

Two interface connectors are provided which allow the TDC 3000 to be connected to a local I/O terminal or a modem, a company spokesman said, adding the controller will respond to control characters from the local terminal or modem.

These characters control up to four tape drives and provide the user with editing capabilities, he noted.

The I/O controller interface costs $2,850 from Tandberg at Suite 407, 4901 Morena Blvd., San Diego, Calif. 92117.

Urges Bell Bill Vigilance

Flatter Rate Structures Coming: Selwyn

By Toni Wiseman
Of the CW Staff

NEW YORK — Rising rates, competitive pressures and consumer demands will continue to dominate the telecommunications scene in the year to come, attendees of the National Retail Merchants Association's annual convention were told here recently.

Dr. Lee Selwyn, president of Economics and Technology, Inc., took a look at the major developments in the field as they affect retailers.

The most significant development in the Bell Bill — or Consumer Communications Reform Act — area came last spring with the judgment in the Telerent case, which said Bell would have to allow interconnection to its facilities, Selwyn said.

Until the Bell Bill comes up for reconsideration in Congress, users cannot afford to relax, he said, urging careful scrutiny of certain rate policies which have been cropping up within Bell.

Traditionally, energy rates have been provided under step-down rate structures, and there have been policies within the energy area which relate to conservation. These include policies flattening the rate structure — with certain exceptions of time-of-day rates — for business, Selwyn said.

Elimination Idea

In communications, however, the industry is not dealing with a scarce or limited resource, he pointed out, but the idea of eliminating bulk rates has caught on.

In the private-line area, for instance, the Federal Communications Commission (FCC) ruled incremental costing could not be applied in the telecommunications field; instead, fully distributed costing must be applied. The immediate effect of this decision was to eliminate the remnants of the Telpak-type rate plan for private services, he stated.

The same type of policy has been applied in other areas, such as Centrex, he said; where the pricing had been incremental, Bell is now using an average-cost approach.

This means the costs for large systems are now greater than for small systems since they no longer benefit from volume discounts, he explained.

New Wats Tariff

Three years ago, Bell filed a tariff eliminating the unlimited Wats plan and replacing it with a full business day service plan, Selwyn said.

Last spring, he noted, the FCC rejected Bell's plan on the grounds of insufficient cost information. Bell was given five months — until last November — to file a new proposal, but it still has not done so, requesting an extension, he said.

While exact, detailed information on the forthcoming tariff is not available, information on the general nature of the tariff has leaked out, he said.

According to these leaks, today's five Wats bands will be reduced to three, designated A, B and C.

In addition, it seems the rate structure will be similar to New York State's intrastate plan with a multistep structure, he said.

Out-Wats will be metered on a time basis in a fairly conventional manner, while In-Wats will be on the same type of multistep structure but with less of a price spread, he said.

The "real rub" is the so-called delivery charge, Selwyn said. In addition to time metering, customers would be charged between 5 cents and 8 cents for every inward call which they get or which receives a busy signal. The object, he said, is to force the customer to install more lines.

While this information is very preliminary and unofficial — the tariff is not due to be filed until April 1 — users should be aware of policies eliminating bulk-type plans and flattening rates, he cautioned.

"In general, if you are making a commitment to bulk service now, you will be faced with larger than usual increases in the future," Selwyn said.

Westinghouse Canada Controller Uses Multiprocessor, Multibus

HAMILTON, Ont.— Westinghouse Canada Ltd. has introduced what it called a highly flexible communications controller employing a multiprocessor and multibus configuration.

The W1655 controller acts as an on-line real-time message switcher and line concentrator to transfer data between a central site CPU and various remote terminal sites, according to the firm.

Data transfer to the central site occurs over two trunk lines operating at 2,400- or 4,800 bit/sec and is handled by the trunk line microprocessor, a Westinghouse spokesman said.

Communications to the terminal sites is accomplished over up to eight primary and eight backup lines at 2,400 bit/sec. Each four primary lines are handled by one remote line microprocessor, he said.

Trunk line traffic is basically under the control of the CPU, which permits a certain flow of data from the controller by updating a permission count detailing the number of message segments which can be sent, he explained.

Shared System Access

Traffic on the remote lines is controlled at the central site for terminal input to the system by a polling scheme scheduling terminal transmission initiation to share system access, the company added.

Each remote line is capable of servicing up to 16 sites; the total number of terminals the W1655 can handle is 1,064, according to the spokesman.

Data responses from the remote terminals are buffered and placed in a queue for transmission to the central site. A site is not polled, the company said, unless an empty buffer exists to store a possible response.

A "typical" price for a controller handling up to four trunk lines is $15,000, the spokesman said. Westinghouse of Canada can be reached through P.O. Box 510, Hamilton, Ont. L8N 3K2, Canada.

T-Bar Switcher Allows Testing

WILTON, Conn. — The Multiple-Access Switching System (Mass) from T-Bar, Inc. was designed to allow testing and monitoring of large on-line communications installations.

The switching system brings up to 512 analog or digital lines to a control panel equipped with a thumbwheel switch and push-buttons allowing single-line interrogation by separate testing and monitoring equipment, according to a T-Bar spokesman.

In operation, a line is selected by the three-digit thumbwheel and bridged to a bus for passive monitoring. Pressing a "Test" button causes an additional bus to be bridged onto the line, creating a break between the two buses, he said.

Interactive tests of local and remote terminals and modems as well as the communications line can then be conducted, he explained.

Controls and instrumentation can be located several hundred feet from the lines being tested, the spokesman added.

Mass has a standard RS-232 interface and the company will "probably offer" a CCITT V-35 interface option when the need arises, according to the spokesman.

Mass hardware for analog or digital lines costs $2,000 plus about $50/line or $100/line respectively, depending on the number of lines desired.

An eight-line digital system would cost $2,500, the spokesman said from T-Bar at 141 Danbury Road, Wilton, Conn. 06897.

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Terminal Transactions

Modular in Design

ITS Unveils Micro-Based Product Line

SANTA CLARA, Calif. — International Teleprocessing Systems, Inc. (ITS) has introduced its Series 1000 line of microcomputer-based intelligent terminals and stand-alone communications systems.

A modular design concept is utilized in the programmable Series 1000 products, which include the Model 1100 printer terminal, the Model 1200 communications system and the Model 1600 small business communications system, ITS said.

An Intel Corp. 8080A microcomputer serves as the central control module. Field upgrading as well as hardware expansion through parallel or RS-232 serial interfaces is easily accomplished, a spokesman claimed.

IBM-Compatible Codes

Hardware features of all three products include both Ascii and IBM 2740- and 2741-compatible communications, 1K byte of line buffer and an IBM Selectric-type keyboard with 19-key numeric pad.

Standard system software includes a disk operating system allowing a user to work with files including sequential or random file or record search.

Basic-Plus software interacts with the disk operating system and features sequential and random file access, assembly routine linking and logic operations, according to the spokesman.

The Model 1100 programmable hard-copy terminal utilizes the Qume Daisy Wheel printer. It reportedly has local text-editing capabilities and comes with an asynchronous interface, the Intel microprocessor and a communications port, he added.

Up to 8K of read-only memory (ROM) and 2K of random-access memory (RAM) expandable to 56K are intermixed to make the printer "look like" a data terminal, he explained.

In the Model 1200, ROM is reduced to 1K byte and the basic RAM is increased to 8K or 16K, he said, adding the 1200 features dual floppy disk drives integrated with the 1100 terminal.

Software for the 1200 includes the disk operating system, a text editor called Letterwriter, communications and the Basic-Plus software, designed for applications requiring off-line storage, he added.

The Model 1600 is a communications system incorporating 32K RAM, 1K ROM, a CRT terminal, a 55 char./sec Qume printer and dual floppy disks expandable to four.

In addition to software features of the Model 1200, the 1600 has a word/text-processing package, orienting it to the business office word-processing environment, ITS said.

The ITS 1000 products are capable of synchronous and asynchronous transmission at rates of 110-to 9,600 bit/sec, according to the spokesman.

The Model 1100 costs $3,750; a basic Model 1200 with single floppy disk drive, disk operating system and the text editor costs $7,800; and the basic Model 1600 communications system is priced at $14,700.

ITS is at 398 Martin Ave., Santa Clara, Calif. 95050.

Interface Adapter Designed for Minis

PHOENIX — United Data Services Co., Inc. (UDS) has introduced a line of port adapters designed to bridge the gap between minicomputer current-loop interface ports and RS-232-compatible terminals.

The minicomputer interface adapter permits plug-compatible substitution of CRTs and other terminals for the Teletype Corp. Model 33, UDS claimed.

The unit adapts equipment with RS-232 voltage or 20mA current interfaces to a computer teletypewriter port, allowing simulation of the characteristics of the teletypewriter signal line interface, according to the firm.

To accommodate variations in the interfacing methods employed by different CPUs, there are two versions of the basic adapter, the firm said.

One version is a four-wire "passive" interface for use with computers which provide their own current loops, such as the Data General Nova and the Digital Equipment Corp., Hewlett-Packard and Interdata CPUs, a UDS spokesman said.

The terminal interface of either version will accept RS-232-compatible equipment or, when supplied with appropriate cable, can be used with 20mA current interface terminals, he said.

The adapter is supplied with a 16-foot computer cable, which includes a plug-compatible teletypewriter port connector, UDS noted.

The terminal interface on the adapter is terminated in a standard receptacle which mates with a plug on the RS-232 terminal data cable, the company said.

The adapter costs $115, UDS said from 3024 N. 33rd Drive, Phoenix, Ariz. 85017.

CRT for Meter Data

OMAHA, Neb. — Darco Management Systems has introduced a small data terminal designed for its industrial monitoring systems to display meter data and equipment status from remote locations.

The Mark I can communicate any four 6-digit functions including customer identification codes, volumes, flow rates, degree days, pressure or the performance of other industrial activities, the company said.

Two 6-digit meter readings plus transponder power or system tampering status can be displayed with one telephone call, Darco claimed.

The $895 Mark I utilizes existing voice-grade lines to transmit data; the system operates through Bell-supplied Data Access Arrangement couplers in dial-pulse or tone-switching networks, he said from 268 N. 115th St., Omaha, Neb, 68154.

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Portable Unit Works With T/S Net

Business Service Finds Printer Terminal a Necessity

NEW YORK — An independent business research, publishing and advisory organization here has no other alternative to utilizing a printing terminal.

Because Business International Corp. (BI) offers a service known as BI/Data which provides integrated international economics data to domestic and foreign businesses — and must make that data suitable for efficient mathematical calculations by its clients — it utilizes computers.

And, to communicate with the General Electric Mark III time-sharing service's computers in Ohio, on which BI/Data is based, the company has an in-house Execuport 3000 terminal made by Computer Transceiver Systems, Inc.

BI's staff here programs, accesses, updates and checks the operational status of its information base with the portable terminal and a dial-up line, according to Pete Mikelson, assistant manager of BI/Data.

The firm gets its data from publications of the International Military Fund, a payments clearinghouse for non-Communist countries, the Organization of Economic Development and from United Nations publications, Mikelson said.

BI/Data supplies demographic, economic and labor data as well as recent estimates of population growth, gross domestic product data, industrial production and cost of living indexes, labor costs, exports and imports and exchange and interest rates.

For 35 countries, the system also provides forecasts of local business conditions and a table of historical data plus projections for the current and coming year for these variables, involving 150,000 numbers.

BI collects the information, makes estimations, "fills the holes" and sends the information to the computer with the Execuport terminal at 30 char./sec, Mikelson said.

The portable terminal, Mikelson noted, is useful beyond its necessary capacities at BI's office here. It is also used for night transactions by members of the company's staff, who sometimes take the terminal home to access the data base, he said.

In addition, the terminal has proved useful in handling large forms because of its 136-column printout and forms-handling capability and, Mikelson said, the staff can travel to prospective clients' offices with it to demonstrate BI/Data's capabilities.

The terminal can also be used to capture 1,200 bit/sec communications when not printing, he added.

BI had an 80-column Execuport 300, as well as a Texas Instruments (TI) Silent 700 and a smaller TI terminal, but it needed the wide forms-handling capabilities of the 3000, he said.

BI/Data clients also have terminals to access the Mark III system, but there are a few who can't or won't subscribe to the network. Information for these clients is obtained through the headquarters terminal and then sent to them in the mail, he said.

There are no terminal restrictions to the Mark III system, Mikelson added.

Tran TDM With Micro Handles Synchronous, Asynchronous Nets

EL SEGUNDO, Calif. — A microprocessor-based time-division multiplexer (TDM) from Computer Transmission Corp. (Tran) accommodates up to 16 asynchronous or synchronous digital data channels or any mixture of both types, the vendor said.

The M1318 Multitran can be used in point-to-point multiplexing between terminal clusters and central computers and is fully compatible with the company's M3200 network switching and management system, according to a spokesman.

The device supports variable mixes of remote job entry terminals, synchronous CRT terminal controllers and interactive asynchronous terminals over voice-grade or dedicated telephone lines, he said.

The M1318 can connect terminals via dial-up or dedicated modems, Tran short-haul data sets or direct EIA cabling, the spokesman added.

Incorporating a programmable microprocessor, the M1318 also provides "optimum multiplexing capability for small- to medium-sized networks," Tran said. The flexibility comes from a new program entered into the microprocessor which meets new synchronous and asynchronous channel allocation needs, the company stated.

Constructed with a single logic circuit board and a separate plug-in power supply, the M1318 provides maximum uptime and minimum maintenance costs because of the limited number of spares required, the spokesman claimed.

The byte-interleaved M1318 can handle asychronous low-speed inputs at data rates of 75-, 110-, 134.5-, 150-, 300-, 600- and 1,200 bit/sec. It also can accommodate synchronous high-speed data rates of 1,200-, 2,400-, 4,800- and 9,600 bit/sec, he said.

Interfaces for the high-speed trunk of the multiplexer are EIA RS-232C and CCITT V.24. For the low-speed channels, the interface is a two-channel module for either EIA RS-232C/CCITT V.24 or MIL STD 188.

This module provides visual indicators for the control functions Send Data, Receive Data, Data Set Ready/Data Terminal Ready, and Busy as well as a diagnostics capability consisting of a switch to perform remote loopback channel testing, the spokesman noted.

Automatic speed recognition is supported as a standard feature for asynchronous channels.

When the M1318 is used to support a remote terminal cluster in an M3200 network, it operates as a dedicated synchronous channel until it reaches an M3201-2 data switch. The data switch demultiplexes and fills the requirements of the individual low-speed channels.

The basic M1318 synchronous/asynchronous TDM is comprised of the interface module, chassis, cabinet and power supply. A complete 16-channel, point-to-point multiplexing network between a terminal cluster and a computer center with mixed synchronous and asynchronous inputs, costs approximately $10,000, the spokesman said from 2352 Utah Ave., El Segundo, Calif. 90245.

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Service Provides On-Line CRTs to Customer Banks

WINSTON-SALEM, N.C. — A large banking industry service bureau headquartered here provides its customers with terminals so the banks can avoid the expense of a mainframe and the personnel to program, operate and maintain it.

Wachovia Services employs two NCR Century mainframes here; Applied Digital Data Systems, Inc. (Adds) Consul 880A terminals are located in all the banks it serves.

"Our on-line system gives each institution a complete profile of its customers," according to Jim Hamrick, Wachovia's president.

"Each one of a customer's accounts — including checking, savings, certificate of deposit and installment loans — is recorded in a single file.

"This simplifies business operations because funds transfers or loans can be accomplished in one step," Hamrick said.

Wachovia's customer profiles also provide a marketing aid by pinpointing additional useful services for each bank's clients, he added.

To access the information, the 880As are operated on-line. Through them, Wachovia's customer banks can query everything from a name and address to a complete client history.

Terminal Transactions

The terminals are also used by the banks to update their account files; currently, more than 150 terminals are installed at the service bureau's customer sites, Hamrick noted.

Wachovia chose the pollable 880As after what Hamrick indicated was thorough on-site testing.

Wachovia's vice-president in charge of operations, Hank Forvendel, said he was "very pleased with the reliability of the terminals.

"It's a large responsibility, providing a system to so many different banks, and when the system goes down our 'hot line' rings off the wall," he explained.

Good Vendor Response

Although there are indications of normal equipment failures, Bill Prince, who provides service for the bank-site equipment, said the vendor's response is excellent.

"When a unit goes down, it takes one phone call and then a replacement part is on the way," he said.

Wachovia also maintains a staff of programmers who oversee the system's software to provide customer banks with up-to-date DP, Hamrick said.

And the service bureau installed all the terminals and telecommunications equipment needed to place the bank on-line, he said.

Executives Gain Informer Device

LOS ANGELES — Business executives can access their business computer operations with the Model I-301 CRT/keyboard terminal from Informer, Inc.

The desktop data entry/inquiry terminal reportedly can be connected directly to a minicomputer or tied into telephone lines for remote applications, Informer said.

Key Spacing Close

Keyboard key spacing is slightly closer than normal, the company said, adding the I-301 screen displays up to 512 characters.

The unit utilizes an RS-232 interface and can operate at switch-selectable rates of 110- to 9,600 bit/sec in half- or full-duplex modes, according to a spokesman.

The I-301, which has special keyboard controls to ensure privacy of system contents, costs $1,850, he said from 8332 Osage Ave., Los Angeles, Calif. 90045.

IBM Enhances 3776 With Form Feature

WHITE PLAINS, N.Y. — IBM is offering a forms-feed feature which is said to provide the IBM 3776 terminal with front or rear paper insertion facilities.

The 3951 front-feed feature is designed to simplify form changes, improve overall job time by reducing set-up times and extend the paper supply height, IBM said.

The forms stand/stacker enclosure continues to be a standard on 3776s with or without the 3951, which costs $400.

Monthly plans are also available for the 3951, IBM said from 1133 Westchester Ave., White Plains, N.Y. 10604.

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DATA COMM NEWS
VADIC "Firsts"

1969 — Vadic designs complete OEM line of low cost Bell compatible 300 & 1200 bps modem modules & PC boards for terminal & computer systems manufacturers.

1970 — Vadic adds IBM & CCITT compatible modems.

1971 — For end-users, Vadic introduces 16 channel system where up to 16 modems & auto dialers can be freely intermixed in 7" high chassis.

1972 — Vadic adds powerful displays & diagnostics, including EIA interface status lights, and local/remote loopback, making it simple to pinpoint problems on any part of a complex data communications system.

1973 — Vadic announces world's first full duplex 1200 bps modem that works on dial-up or two wire leased lines. Called "the most significant advance in modem design in years".

1974 — Vadic designs system which permits 60 modems to share a single automatic dialer. Vadic introduces 2400 bps modem.

1975 — General Electric now installs, leases & services Vadic modems at 50-plus service centers in US. 100,000th modem shipped by Vadic.

1976 — Vadic is first modem manufacturer to obtain certification for direct connection to switched network in California eliminating need for Bell DAA.

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Operations Management — Part 1

Broadening Scope of DP Seen Changing Manager's Role

By Louis Fried
Special to Computerworld

What is the present role of the data center manager?

What will be the future of the data center?

What must the manager do to assure future success?

These questions were raised in a panel discussion at a recent meeting of the Computer Operations Managers Association (Coma) in the San Francisco Bay area.

The conclusions reached should prevent any operations manager from becoming complacent about his current role and position.

The current role of the operations manager compares closely with that of a manufacturing plant or production shop.

In daily operations, his responsibilities include complex job scheduling, managing activities to meet schedules, determining the cause of error on production runs, accommodating schedules to perform reruns, controlling input, output and inventory and coordinating special jobs.

He is also responsible for maintaining equipment and media, managing an increasingly complex combination of data conversion, telecommunications and DP as well as report publication facilities and personnel management.

The operations manager is on the frontline of customer relations in dealing with user complaints and attempting to maintain the good will of the users.

There is also the task of vendor relations to assure proper service, equipment maintenance and a flow of information on new equipment.

Planning Activities

In addition to the above, the operations manager is called upon to perform a whole range of planning activities which include computer performance measurement, analysis of equipment requirements, analysis of supplies requirements, hardware evaluation and selection. Further, he must review systems designs, review and approve program operating documentation, allocate costs to users, analyze internal efficiency, plan improved use of the computer as an operations management tool and give attention to career planning for personnel, budgeting and facilities planning.

Even at today's level of responsibility, the role of the operations manager demands a higher level of business and academic background than it did a few years ago.

We have already reached the point at which a B.A. in business or in computer sciences is almost mandatory for this position and, in larger installations, an M.A. degree is often specified.

The operations manager is responsible for 55% to 65% of the DP budget and bears a major responsibility, in many companies with on-line systems, for the successful operation of the production or service activities of the company.

This, of course, raises a significant question for operations managers. Why, for the most part, are their pay scales lower than those of systems or programming managers?

Recent developments in the technology of DP make it reasonable to forecast that the data center environment will undergo substantial modifications within the next five to 10 years.

The price/performance ratio for both large and small computers will continue to improve.

The size of both CPU and memory will shrink while capacities increase. Newer CPUs and memories will require less power and air conditioning.

As more functions are put on integrated circuits and cards, maintenance costs will be able to stabilize and the time necessary to recover from a failure should drop.

The demand for on-line data bases will continue to increase, but new devices will reduce the cost per byte of secondary storage.

This is the first in a series of articles on the changing role of operations management.

Mass memory devices with higher capacities and transfer rates are already appearing.

Magnetic tape media will continue to be used where portability is needed, but will increasingly become e media for archival storage as electronic (rather than electromechanical) multibillion bit memories reach the market.

This combination of factors will eliminate most of the tape mounting and pack changing that currently occupy the time of computer operators.

The science-fiction idea of a single console operator running the computer room is not too far away.

The trend toward distributed DP will have a major impact on the data center. Networks composed of communications lines and mini (or midi) computers linked to the data center computer will take over more and more of the actual processing of data.

Input functions will move almost completely into user hands, eliminating the "keypunch section." Input activities will move to minicomputers that support data entry prompting, interactive data entry, file interrogation and data capture associated with text editing.

These same minicomputers will drain output activities from the data center by providing for remote printing and acting either as conduits for terminal inquiry to a central data base or as local data base management facilities.

They will also use a data center computer (on an RJE-type basis) for overload processing or performing DP activities too large for their internal capacity.

For the data center, this means less and less control over what is being processed at any given time. Scheduling of the data center computer will become increasingly difficult.

Performance measurement and the resulting equipment specifications will concentrate on meeting peak loads and supplying certain levels of computer capacity rather than on scheduling methods that permit load leveling to the existing capacity.

The net result for the operations manager is that the role will change from that of a "production shop manager" to that of a "resource manager."

CLA Names 'Executive of Year,' Cites Four 'Exceptional Achievers'

WASHINGTON, D.C. — Robert W. Strong, manager of management information services at Brockway Glass Company, Inc. in Brockway, Pa., has been named "Executive of the Year" by the Computer Lessors Association (CLA).

Four other DP professionals were cited for "exceptional achievement" in DP management by the group.

They include Lewis J. Bohache, assistant vice-president, Farmers Insurance Group, Los Angeles, Calif.; Tom Braswell, assistant vice-president and corporate director of DP, Genuine Parts Co., Atlanta, Ga.; Tom Crosby, manager of computer services, Amana Refrigeration, Inc., Amana, Iowa, and Brian P. Doran, general manager, Transportation Teleprocessing Systems, Inc., Jacksonville, Fla.

The awards are based on outstanding DP achievement with emphasis on price/performance, efficiency, economy and corporate effectiveness in the operations managed by the nominated candidates.

Strong joined Brockway in 1946 and founded the firm's DP department at a time when annual sales totaled only $9 million.

About 30 years later, Brockway is a Fortune 500 company with sales in excess of $390 million and a DP department handling many millons of characters of information daily for sales offices and plants across the nation.

Strong has saved more than $2 million since 1967 by obtaining computer equipment from third-party leasing firms.

Today he has an IBM 360/50 system with eight 3330-type disks running under Extended DOS (Edos) along with a second leased 360/30 disk system at a branch location.

A believer in multivendor systems for maximum economy, Strong operates non-IBM terminals, non-IBM disks and non-IBM software (Edos) — all in a remote part of Pennsylvania far removed from the major metropolitan areas.

In 1964, Brockway's sales totaled $130 million, and Strong's DP budget was $780,000. In 1975, when sales had tripled, his budget was not quite double, only $1.5 million.

Two Versatec Electrostatics Challenge Pen-Type Plotters

SANTA CLARA, Calif. — Versatec has introduced two electrostatic plotters designed to "supplement or replace pen plotters," according to the firm.

The units are 30 to 100 times faster than the pen-type units, Versatec claimed.

Both produce 36-in. wide E-size drawings, with the Model 8136 operating up to 2 in./sec, and the Model 8236 running at .75 in./sec.

The 8236 has 200 dot/in. resolution; the 8136 has half that resolution.

The units plot a raster of data across 35.2 in. in one scan. They can shade, tone or draw variable line widths with a single command and they can produce continuous plots up to 500 ft in length, Versatec said.

Versatec controllers are available to link the plotters with IBM 360 or 370 models as well as other mainframes.

An IBM 360/370 plotting system controller converts conventional pen plotter data to rasters for electrostatic plotting with reductions in CPU time, core memory and I/O transfer, according to the firm.

Prices range from $25,000 for the 36-inch plotter with 100 dot/in. resolution to $34,500 for the 36-inch unit with 200 dot/in. resolution and character generator.

Versatec is located at 2805 Bowers Ave., Santa Clara, Calif. 95051.

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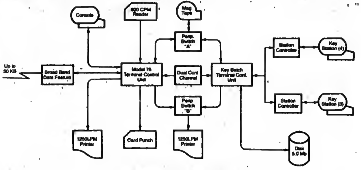
Switch to Key-to-Disk Net Brings Brace of Benefits to Steel Firm



Armco Steel's Data Entry System

MIDDLETOWN, Ohio — Armco Steel Corp. here switched its data entry operation from punched cards to a key-to-disk system three years ago and found a savings in money and labor plus increased productivity and reduced errors, the user said.

Armco employs 48,000 people in its steelmaking, metals fabrication and mining organization and other diversified operations. Total worldwide sales are over $3 billion.

The firm installed a Data 100 Keybatch system in December 1974, replacing an IBM 360/20 system and seven IBM 029 and 059 keypunch/verifiers.

The company was looking for greater economy and more flexibility in the data entry area and wanted to accomplish data entry operations that would have been difficult to achieve with card equipment, according to Wendell Dennis, supervisor of computer operations.

The current system consists of a dual-controller Model 78 Keybatch system installed in the firm's general offices. Attached to the Keybatch portion of the system are seven CRT keystations used for data entry, an 800 bit/sec magnetic tape drive and a 5M-byte cartridge disk.

Connected to the Model 78 controller are two 1,250 line/min printers, a CRT console and a card reader and punch.

The card equipment is used for certain smaller jobs that do not lend themselves to key-to-disk entry, the firm said. A peripheral switch between the two controllers allows going directly to the printer from the Keybatch or directly to the host computers.

The system is connected over a 50 kbit/sec line to three host computers, also in Middletown: two IBM 370/168s and a 370/158.

The system is used to process about 600 application programs. A few of the larger jobs include invoicing for customer orders shipped from steel plants, stockholders' dividends, a retiree payroll for about 10,000 people and the 2,000-person general office payroll, which includes the company's headquarters and sales offices around the country.

The terminal system also provides data entry/output for sales analysis reports which are generated from invoices.

The operating software is IBM's OS/MVS. About 70% of the application programs are written in PL/I, with the remainder in Cobol and Assembler.

The Keybatch system is operated two shifts a day, five days a week, while a Model 78 remote job entry terminal is operated around the clock five days a week.

The number of batches submitted per day is about 85. Data entered through the keystations is first stored on the cartridge disk, then transmitted via the Model 78 to the host computer.

Transmission to a particular file is directed by JCL, which is stored on the cartridge disk and transmitted before the batch of data to be processed. Output is received through the Model 78's two printers.

Formatting Capabilities

A principal reason for the increased efficiency achieved by Armco in its data entry operation has been the formatting capabilities of the Keybatch system, the firm said.

Under software control, as many as 999 input formats are permitted, with each input format permitting as many as 99 format levels on each job-in.

For example, one accounting system has about 75 format levels available with one job-in. According to Dennis, in one pass through all documents the operator can key in any format level without wasted keystrokes.

As soon as the operator keys in the code to define the record, the system brings in the format for that record, with no manual intervention required and no slowing down of the data entry process, he said.

Keying in one format at a time, the operator might be required to go through the input data 75 times, he noted.

Another example of savings in keystrokes in accounts receivable processing concerns the debit and credit record system for customers who overpay or underpay their accounts. Under the former punched card system, each customer record had to be keyed twice, once for a credit and once for a debit for any change in the account.

Now the record is keyed just once and, through the arithmetic capability, two output records are generated, a debit and a credit, by changing the sign of the amount field at output time, Dennis explained.

Along with the saving in keystrokes and greater simplicity is improved accuracy, he said. Built into the software are certain limitations, a range of illegal and legal values and specifications for a certain keystroke, which ensure errors are caught before they ever get into the full entry stage.

Armco uses the Keybatch software Modulus 10 check-digit algorithms in one major application to check a customer's numbers. The system eliminates the need to manually verify all nine digits, further cutting down on keystrokes.

The result has been more records per hour, fewer people required for data entry and significantly fewer errors, Dennis said.

Taking into account system cost and the greater efficiency that has been achieved, the company is probably saving about $1,000/mo over the former keypunch system, he estimated.

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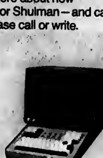

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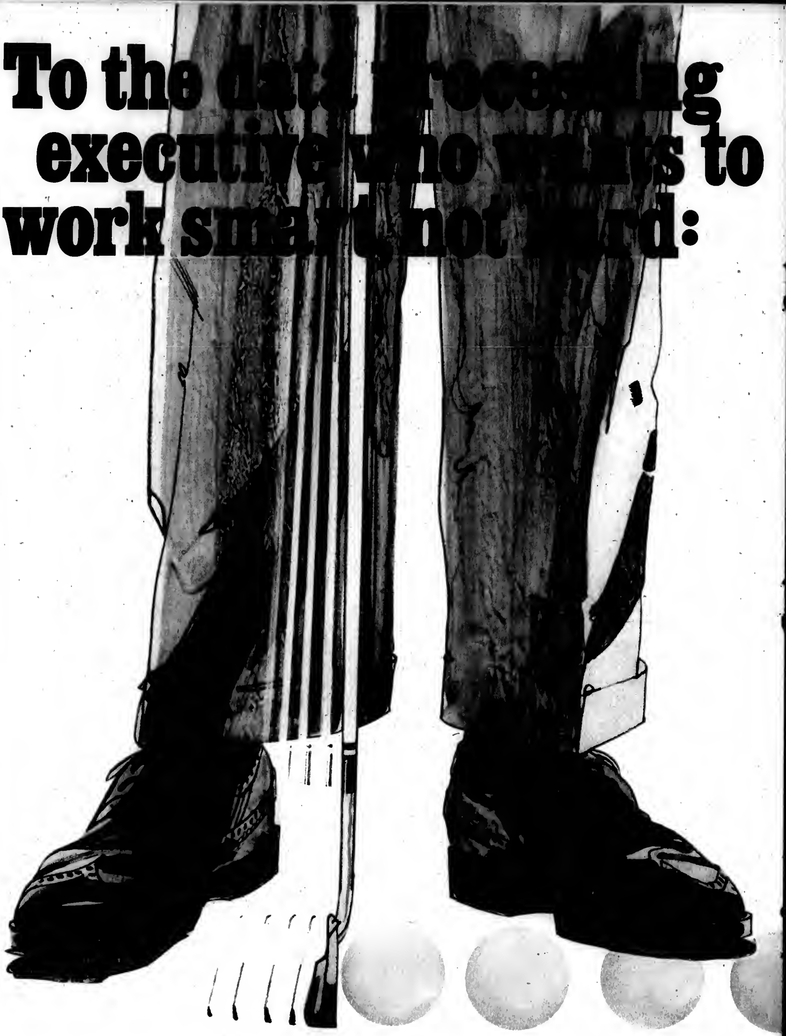

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IBM 3 Users Incorporate

LOWELL, Mass. — The New England System 3 Users Group, a non-IBM-affiliated organization not open to vendor membership, has incorporated. The group has been in operation for five years, according to a spokeswoman.

The group, with over 200 member companies, conducts meetings the third Wednesday of every month except August and December. Professional speakers on varied topics in general management and IBM 3 technical topics address the group, she said.

Membership is $15/year per company. Further information is available from Joseph Quartarone, Lowell Shoe, 95 Bridge St., Lowell, Mass. 01852.

Charles River Data Offers Add-On Floppy for LSI-11

WALTHAM, Mass. — The FD-11/L dual floppy disk add-on for the Digital Equipment Corp. LSI-11 microcomputer is available from Charles River Data Systems, Inc.

The unit provides a formatter and interface on a single card which plugs into the processor's small peripheral slot, the firm said.

The add-on is software-compatible with DEC's RX-11 instruction set, features 6 msec track-to-track access time and includes write/protect switches, a spokesman stated.

The FD-11/L costs $2,750 from 235 Bear Hill Road, Waltham, Mass. 02154.

Memorex Designs OEM Floppy With IBM Compatibility

SANTA CLARA, Calif. — Memorex Corp. has an IBM-compatible floppy disk drive designed for OEMs configuring data entry and small business systems.

The Model 550 provides a recording capacity of up to 800K bytes of unformatted data or 243K bytes in the IBM 3740 format, according to the firm.

With an appropriate controller, the drive can be operated in double-bit density mode without modification, a spokesman added.

The unit is lighter in weight and smaller in overall size than traditional drives, Memorex claimed.

Four drives can be mounted vertically or two horizontally in a 19-in. rack. A drive select feature allows two or more 550s to be connected and operated in either radial or serial mode, according to the spokesman.

A lock/stop feature prevents closure of the cartridge door if it has not been fully inserted or removed.

Users can optionally add a second index transducer to the unit to allow recording on the reverse side of a disk when it is flipped over.

Memorex would not release prices for the unit. The firm is at San Tomas at Central Expressway, Santa Clara, Calif. 95052.

Basic/Four Adds Matrix Printer

IRVINE, Calif. — Basic/Four Corp.'s Model 3510 300 line/min matrix printer features a standard 96-character upper/lower case character set, the firm said.

The printer can be used with all Basic/Four systems, the company stated. It can process a large volume of forms and also has graph plotting capability, a spokesman added.

Users can select either 6 or 8 line/in. Double-height characters can be produced for report titles on forms up to 16-in. wide, he said.

The Model 3510 costs $11,900 or $262/mo on a 66-month lease plus maintenance plan. Basic/Four can be reached at P.O. Box C19550, Irvine, Calif. 92713.

Burroughs Fills CPU Gap

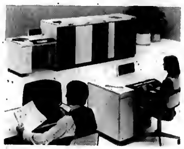
B800 Provides Twice B700's Power

By Esther Surden
Of the CW Staff

DETROIT — Burroughs Corp. has introduced the B800 to fill the gap between the firm's B80 small business system and its B1800. The B800 is the successor to the B700 system and is said to provide up to two times the processing power of the B700.

In the range of the Digital Equipment Corp. Datasystem 350, Basic/Four Corp. 350, NCR 8200 and Century 50 and the IBM 3, the system was designed for both business and distributed processing applications, according to a spokesman.

Two B800 models were announced. The B810 operates at 1M cycle/sec and has a 32K-byte MOS memory with a 500 nsec access time for two bytes of data, Burroughs said. It can be expanded to 128K bytes.



Burroughs B800

The B820 has 16K bytes of MOS memory and a faster 16K-byte bipolar control memory, the vendor said.

The control memory reportedly features a 70 nsec access time for two bytes of data.

The B820 processor, which is also expandable to 128K bytes, operates at 2M cycle/sec, the spokesman added.

Both systems are object code-compatible with the B700; all application programs can be transferred from that system to the B800, Burroughs claimed.

The B800 is also said to be program-compatible with both the B80 and the B1800 via Computer Management System operating and application software.

Memory access for the B800 is controlled via a microprocessor called a Direct Memory Access Control (DMAC). The DMAC allows the disk I/O control and data communications processor to share memory cycles with the main system processor and controls the priority of access for the three sources, Burroughs said.

To facilitate the system's use in communications applications, Burroughs is offering a data communications processor for the B800 that reportedly accommodates transmission speeds up to 9,600 bit/sec and broadband speeds of 64 kbit/sec.

The operator console for the system can either be a 120 char./sec matrix printer or — for the first time in a Burroughs system of this size — a 256-character Self-Scan display. Both consoles have alphanumeric keyboards.

Fixed disk drives with capacities of 9.4M-, 18.8M-, 28.2M- and 37.6M bytes and an average access time of 55 msec have also been added to the system to complement other disk offerings. Up to two drives can be accommodated, the spokesman said.

In addition, up to four removable disk pack drives with capacities of 65.2M- and 130.4M bytes and a 33.3 msec average access time can be attached to the B800.

A basic 810 with 64K bytes of memory, 120 char./sec printer console and 4.6M bytes of cartridge disk costs $35,900 or can be leased for $1,073/mo.

A typical B820 system with 64K bytes of memory (16K bytes of which is a 70 nsec bipolar control store), screen-based console, data communications processor, 4.6M bytes of cartridge disk, 160 line/min printer and TD 734 terminal costs $50,400 or $1,505/mo, Burroughs said from Detroit, Mich. 48232.

Library 'Checks Out' Inventory With OCR Wands Linked to CPU

By Mal Stiefel
Special to Computerworld

E. BRUNSWICK, N.J. — The municipal library here has installed an on-line book circulation and inventory system which uses hand-held optical character recognition (OCR) wands tied to an IBM 3/15 at the township's DP center next door to the library.

The system, which began operating last October, supports circulation (checking materials in and out), inventory, ordering and renewal functions for the library. Staff personnel can retrieve the status of a library cardholder or renew a book over the phone.

The counter clerk is notified by a CRT-displayed message when a book or other item being checked in is overdue or has been reserved by another library patron.

The system prints overdue notices and reserve notices every day on specially designed mailer forms, and it prints index cards for each item added to the holdings.

In addition, it generates monthly management reports including utilization statistics by patron types (in-town or out-of-town residents) and by subject category (fiction, sports, biography).

A yearly report of inactive items will be used by the librarians to evaluate the holdings and cull unwanted material from the inventory.

Checking is facilitated by use of the Model P130 OCR wand from Recognition Products, Inc. of Dallas; the wand reads OCR-A font characters from labels pasted on the books and from new plastic cards issued to all patrons by the library.

When the wand is passed over a patron's card, the system reacts (usually in 3.5 seconds) by displaying the patron's name, address and status on the CRT. Similarly, the book title is displayed when the wand is passed over the label.

Patrons seem to enjoy the feature, according to library director George Happ. It gives them confidence in the accuracy and reliability of the system, he said.

Transactions are captured on diskette so the circulation function can operate even if the computer is down.

The library cards, designed by RD Products of Victor, N.Y., were designed to be compatible with the existing manual Gaylord system. The Gaylord imprinters can accept the reversed, upside-down raised characters on the new card in place of the metal slug on the familiar library card used throughout the country.

With Gaylord compatibility, the cards are expensive — 50 cents each — but they can be used in manual systems at a dozen other libraries in nearby towns where East Brunswick patrons also enjoy borrowing privileges.

The system, which cost $28,000 to develop, includes three IBM 3277 CRTs, two wands and the Total data base management software package from Cincom Systems, Inc. for random access to the files.

Applications programs were written in RPG-II over a six-month period by the township's DP staff, which was also supporting other municipal maintenance and development projects at the same time. Three people participated in the development effort.

In one month, new Mylar-coated Avery labels were typed for each of the 70,000 items in the inventory. The entire staff was mobilized over the Labor Day weekend to attach the labels to the books.

New library cards were issued to all 20,000 patrons during a registration period to complete the conversion task.

Wand Burns Out

Shortly after the system was declared operational in October, the prototype wand, which had been used for testing, "blew a circuit" in an accident that also

(Continued on Page 37)

System Sitting at Finish Line Speeds Results of Club Marathon

DALLAS — When the dust settled at the White Rock Lake Marathon here last month, there was no doubt about the race's winner because the results were tabulated at the finish line by a small business system.

With a time of 2 hours, 15 minutes and 11 seconds, the winner, Jeff Wells, clipped off more than five minutes from the old record in the event sponsored by the Aerobics Research Center and Cross Country Club.

The applications programming for the effort was developed by analysts at Aerobics and the mobile equipment to run the applications was donated by Datapoint Corp., according to Steve White, systems analyst.

The marathon promotes Aerobics' dedication to progressive and scheduled exercise to avoid or avert cardiovascular disease. The programming for the race was done in a lab that maintains a data base to track a group of people over a period of years to determine the beneficial effects of exercise on heart disease, White explained.

"The lab does not do any research itself," he noted, but receives the medical information and computerizes it. The real number-crunching types of statistical operations are taken care of by an IBM 370/158 at the University of Texas Regional Computer Center.

The data is batched over 2,400 bit/sec lines to the center, he added.

The configuration at the lab includes a Datapoint 5500 with four 25M-byte disk drives running in dual partition.

"The people who were making the plans for the marathon thought it would be nice to have a computerized results system," White explained. Aerobics originally talked about having terminals at all the checkpoints, "but with setting up phone lines and needing modems, this was much too costly for a one-time event," he said.

"We thought we could probably come up with a finish-line scoring system and we decided to work toward that."

Three 3600 data stations connected to a 5500 with a 600 line/min printer were used on the day of the race. The system produced printouts with a breakdown by preassigned race classes such as female open, males 64 and over and males 16 and under.

The system kept working and even recorded the last person to cross the finish line — at a time of 5 hours, 5 minutes.

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Gemini Has Interdata-Based Turnkey

ENGLEWOOD, Colo. — Gemini Information Systems, Inc. has a turnkey system based on the Interdata, Inc. 6/16 and 7/32.

The 6/16-based system features 65K of memory, a console operator's terminal, 25M-byte disk system, 400 card/min reader and a 200 line/min printer.

The system also includes a software package which features OS/16MT2, Fortran IV and Gemini's Data Demon (a data base management and query system designed especially for minicomputers).

An accounting system designed to assist the accountant in recording transactions, compiling reports and summaries is also included.

The 7/32-based system features 128K of memory, an 80M-byte disk system, 800- and 1,600 bit/in. magnetic tape system, 600 line/min printer, a 400 card/min reader, and a four-terminal interface.

Software Included

It also includes a software package consisting of OS/32MT, Fortran V, Cobol and the Data Demon.

The 6/16-based system costs $43,500 and the 7/32-based system costs $85,500.

Gemini is at 5650 S. Syracuse Circle, Englewood, Colo. 80110.

Library Links OCR Wands, CPU

(Continued from Page 36)

knocked out one of the 3277's.

According to Happ, a card reader adapter which used a cable connector identical to the OCR wand connector should have been removed because the library decided not to hook up the card reader. But the adapter was left in place.

Then, inadvertently, one of the library employees plugged the wand into the adapter socket instead of the wand socket, shorting the 3277 power supply and damaging the wand.

Wand repair by Recognition Products took six weeks. During that time, the circulation function was running in hybrid mode: About half of the books were checked out with the old manual Gaylord system; the others were handled by keying data directly into the computer via another 3277.

With the wand back at the repair shop, there was a bit of a queuing problem at the library circulation desk, Happ indicated, with the book volume approaching 1,200/day. The desk jam was relieved, however, when the wand was returned.

In the backup operation, keying was done through the 3277 until the lines started to huild up at the circulation desk. Then the manual system was used until the congestion was reduced, Happ explained.

The prototype wand worked reliably and quickly during the test period, and it has been operating properly since it was repaired. (The card reader adapter has been removed.)

Two production versions of the P130 wand are expected to be delivered shortly.

The project began in January 1975, when management predicted a significant jump in business after the library's planned move into new quarters late in 1976. Transaction volume rose to 300,000 items in 1976; traffic is expected to increase another 50% in the next few months, Happ said.

With such a growth rate, the administration felt compelled to seek ways of automating the operation as an alternative to adding more personnel.

An IBM System 7 dedicated to the library function was considered. It was rejected on two counts — first, storage capacity was limited, so only part of the patron file could be placed on-line; secondly, the system could not support the printing of overdue notices.

The library staff also studied a standalone $100,000 system from CLSI of Newtonville, Mass., but that system was deemed too expensive. In addition, it used a bar code instead of OCR-A, and the library management wanted OCR-A.

Management felt OCR-A offered two critical benefits: The code was human-readable, so staff could adapt to it easily; and Selectric typewriters could be used with special typing balls for easy replacement of worn book labels.

The township, alredy convinced of the viability of the hand-held wands, is planning to buy two more wands to use in its water billing and real estate tax billing operations. Bills will be printed in the OCR-A font, and wands will be used to read them when they are returned with payments.

Capability Lets GRI System 99 Interface With Remote 3741s

N. BRUNSWICK, N.J. — GRI Computer Corp. has enhanced its System 99 minicomputer-based small business system with the ability to attach remote IBM 3741s to the system, a spokesman said.

The communications capabilities allow users to link the 3741 data stations to the system. Transmission rates of up to 4,800 bit/sec to and from the remote key to diskette batch data systems are accommodated.

Two Access Methods

Supported by GRI's communications control language, users are said to be able to access the 3741s interactively or by a command which activates disk-stored communications control streams.

They can be accessed either manually or in an unattended dial-up operational mode, GRI noted.

Up to three synchronous ports can be concurrently supported on a 64K-byte System 99 with any port accessed from any partition of at least 14K bytes, the firm added.

No Wait for Transfer

The enhancement allows users with IBM 3741s in remote offices or warehouses to process batch data on the central office's System 99 without waiting for manual diskette data transfer between remote sites and the main office, the company stated.

The communications package includes the synchronous interface, a modem control unit and the communications control language software. The package is priced at $4,335 from GRI at 870 Georges Road, N. Brunswick, N.J. 08902.

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In Personnel Productivity

Minis at Ford Lab Increase Accuracy, Save Money

DEARBORN, Mich. — Minicomputers at the Ford Motor Co.'s Central Laboratory Services here are producing increased accuracy while saving money in personnel productivity and clerical staff reduction, according to Frank Kunz, supervisor of the development group for graphic and laboratory services.

The lab processes between 50 and 70 requests for service each day, ranging from materials certification to the development of special methods and procedures. The staff and resources of each department must be allocated to the specific jobs at hand.

Ford decided to go with automated systems to increase efficiency, Kunz said. Prior to using minis, all the lab work was done manually.

The present system was built from the top down in order to ensure it could be used efficiently to generate reports as well as laboratory functions.

These functions include instrument automation; time-sharing for analytical data reduction; job control and tracking; customer billing for work done and laboratory budget control; and routine purchasing of testing supplies.

After the decision was made the lab considered systems from Digital Equipment Corp., Data General Corp. and Hewlett-Packard Co., according to Kunz.

The DEC system was chosen partly because of Kunz's familiarity with it from a prior project and partly because of its modularity and price, he said.

A host/satellite configuration couples a DEC PDP-11/40 with analytical instruments that have their own imbedded or adjacent minicomputers and/or microprocessors, Kunz stated.

Three RK05 disk cartridges allow random access storage of 3.6 million bytes, he noted.

The host computer has 28K words of main memory, expandable to 128K words, and can support up to eight magnetic disk cartridges. It operates under RSTS-11 and can support up to 16 interactive terminals. Applications programming is done in Basic.

Data processing is shared, for example, by a satellite PDP-11/10 serving an electron microprobe and the host computer, Kunz said. Automating most analytical scientific instruments requires mass data storage devices.

The host computer can provide that storage capacity, peripheral support and large-scale data reduction more cost-effectively than a decentralized system in which all the necessary computer power for performing automated functions is available in each specific instrument, he explained.

The satellite computers provide instrument control, data collection and limited data reduction and reporting on a stand-alone basis. Should any discrete computer in the system be out of service, the total system would still be operative, Kunz stated.

Over $100,000 Saved

Between May 1974 and May 1975, the first year of operation, the integrated system saved over $100,000 by increasing personnel productivity, Kunz noted.

Calibration curves for the X-ray flourescence spectrometer, for example, take 24 hours to calculate manually. An imbedded microprocessor, the host PDP-11/40 and special application programs allow the same calculations to be completed within one hour, he said.

Central Laboratory Services has developed a statistics program which reduces calculation time from two hours to five minutes, he added.

Faster turnaround has allowed analysts to be more thorough, he pointed out. The time saved can be used to repeat tests or to perform variations on them.

Further, the laboratory system has meant that Central Laboratory Services can accept larger and more complex materials analysis assignments.

Results are available three weeks earlier than they would have been without the system with a representative savings of over $1,300 on one project alone, he added.

Greatest Cost Savings

The greatest cost savings have come as a result of clerical staff reduction in the sample receiving section, with 2.5 clerks transferred to other duties at a yearly savings of $70,000, Kunz reported.

A job control and tracking subsystem allows clerks operating DEC VT05 CRTs to enter all information relevant to a specific job directly into the host computer. The subsystem can accommodate 7,000 records in the job master file, he said.

A Status program provides for daily master file updating and interactive Search and Lookup programs allow on-line queries to any job record in the master file.

Daily management information system reports of various kinds are made possible by five subsystems — job control and tracking, billing, central stock, purchase order and budget. These now take one hour a month of clerical time to produce as compared with five clerical days-per-month prior to installation, Kunz said.

Desktop Unit 10 Times Faster

FORT LEE, N.J. — Micro Computer Machines, Inc.'s MCM/800 system is a desktop APL computer said to be 10 times faster than its MCM/700 predecessor.

The system operates in stand-alone mode using virtual memory techniques, according to a spokesman. The expanded operating system can reside on floppy disk or on optionally available diskette.

A redesigned power fail-safe protection system uses internal batteries to allow the system to continue to operate during transient power failure or shut down "in an orderly fashion" in the event of an extended outage, the spokesman explained.

The unit can operate with the firm's MCP-132 printer plotter which runs at from 30 char./sec to 45 char./sec with a 15-in. wide print line, he added.

Either single- or dual-diskette units can be attached to the system with a capacity of 256K byte/diskette and a 260 msec average access time. Card reader and CRT can also be used with the unit, the firm added.

A basic 4K MCM/800 with 32-character plasma display and standard APL keyboard with auxiliary numeric keypad costs $8,000. With 16K of memory it costs $10,000 from 2125 Center Ave., Fort Lee, N.J. 07024.

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CI Notes

Memorex Gains Two Firms

SANTA CLARA — Memorex Corp. has agreed in principle to acquire Business Systems Technology, Inc. (BST), supplier of peripherals for small systems, especially the IBM 3.

The transaction is intended to be a tax-free exchange. Memorex proposes to exchange about 346,000 shares of stock for some 501,500 BST shares, a transaction valued at about $8 million.

The acquisition is subject to a definitive agreement and approval of both companies' boards and BST's shareholders.

Memorex has also agreed to acquire Lencor International for $2.4 million in cash and 200,000 shares of common stock.

Lencor is the sole owner and shareholder of CFI Memories, Inc., which manufactures tapes, disks, and IBM 3 add-on memories.

EMM Managing CMI Base Of IBM 360/370 Memories

LOS ANGELES — Electronic Memories and Magnetics Corp. (EMM) has taken over management of the 360/370 memory lease base formerly owned by Cambridge Memories, Inc. (CMI).

The CMI lease base had previously been acquired by three banks headed by the First National Bank of Boston. Both EMM and the banks have transferred their lease bases to a separate company and, under a new management agreement, the combined lease bases are now being managed by EMM.

As a result of the transaction, this combination of add-on memory lease bases is second only in size to that of IBM, according to EMM.

Adds Granted Injunction Barring Milgo Stock Sale

NEW YORK — Applied Digital Data Systems, Inc. (Adds) has been granted a preliminary injunction barring Milgo Electronic Corp. from selling 312,000 Milgo shares to Racal Electronics Ltd. until April 15.

Federal Judge Edward Weingeld ruled that Adds had raised issues and established a potential hardship that were substantial enough to warrant the injunction, pending a trial.

Memos at Calcomp Trial Show

IBM Lease Plan Halved PCM Market

By Molly Upton
Of the CW Staff

LOS ANGELES — IBM's Fixed Term Plan (FTP) cut in half the plug-compatible manufacturers' (PCM) shipments and order rates within three months of its 1971 announcement, according to IBM memos exhibited here in the California Computer Products, Inc. (Calcomp) vs. IBM antitrust trial.

The documents show that although IBM expected an initial loss of revenue from the plan, the net effect of the forthcoming FTP and a price hike on 360 and 370 CPUs would be "a wash."

Thus IBM used its strength in the system area to assist ih its retaliation against the PCMs, according to Calcomp attorney Max Blecher.

The documents, many of them unearthed by Calcomp and shown in court for the first time, detail the effects of the FTP and other previous attempts by IBM to defend its base of tape and disk drives from the increasing incursion by PCMs.

Among the previous attempts were the 2319A and B disk systems for 370s and 360s respectively.

These not only represented a price cut on each spindle since they were repackaged 2314s; but also marked the inauguration of IBM's scheme to integrate controllers into CPUs, according to the deposition of Joseph G. Fitzgibbons, formerly president of Memorex Corp.'s sales and service organization.

Plan Altered Base's Pricing

IBM top management was distressed by the delay of other levels of IBM management in either dealing effectively with the erosion of its peripherals base or bringing the matter to its attention sooner, according to one memo.

Top management's solution, the FTP, did the very thing all other IBM planning efforts had thought could not be done: It altered the pricing of the installed base; the memo said.

The FTP, announced May 27, 1971, consisted of 8% and 16% reductions from IBM's monthly rental charges if the customer signed leases for one or two years respectively.

It also abolished extra shift charges which, the documents show, IBM recognized to be a significant portion of the price differential between it and the PCMs.

The impact was almost immediate. Between January and May of 1971, the PCMs shipped a monthly average of 941 Model 2314-type devices. From June to August, however, this figure dropped to 506/mo, according to IBM's estimates.

The picture was nearly identical for orders booked — about 900/mo before FTP and 495/mo afterward, the IBM memos estimated.

In October, IBM said PCM tape shipments were reduced 62% and disks 48% from the previous levels.

The number of units being signed up under the FTP exceeded IBM's projections. IBM expected 40% of its installed disk, tape and printer base would sign up by the end of 1971.

But as of Aug. 1, 55% of all eligible units had been converted to the FTP. The split was even between one- and two-year signers, according to a memo from Gene Justice of corporate marketing to Warren C. Hume, a vice-president.

Accounts Wooed Back

Furthermore, IBM was starting to win

(Continued on Page 44)

CCIA Asks Dataspeed Tariff Stay, Charges FCC Violated Own Rules

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. — The Computer & Communications Industry Association (CCIA) has filed a motion asking the FCC to reconsider and stay its order permitting the interstate tariffing of AT&T's Dataspeed 40/4 pending the outcome of the commission's Computer Inquiry II [CW, Jan. 10].

The CCIA motion asserted there is a strong likelihood of success in reversing the decision to grant the tariff because the FCC violated its own rules, formulated in Computer I Inquiry, by allowing AT&T to offer the Dataspeed 40/4.

The commission had admitted in its order that the terminal is a data processing device, the association pointed out.

Even if one were to assume the Dataspeed does perform some message switchng, the fact that it also performs data processing requires the FCC, again by its own rules, to determine whether the offering is a "hybrid communictions service" or a "hybrid communications processing servle," the CCIA argued. The commission has failed to do this, the motion noted.

The motion further charged the FCC "misread its own findings of fact" in Computer Inquiry I because the order stated the original Inquiry did "not adress the distribution of data processing among devices other than the central computer."

In additin, FCC Chairman Richard E. Wiley's concurrence with the order stated the first Computer Inquiry "did not purport to prescribe rules and definitions for terminals," the motion said.

The CIA alleged such a reading was "clearly in error," arguing that one of the FCC's Computer Inquiry I rules deals exclusively with "remote data processing sevices," i.e., terminals.

The commission ruled arbitrarily by making its order contingent upon the outcome of Docket No. 20828 (Computer Inquiry II), already in progress, the CCIA charged, stating the "commission has engaged in

(Continued on Page 44)

Spin-Off Spins Off

TULSA, Okla. — Another of the spin-off lawsuits from the Telex vs. IBM trial is nearing completion.

In further developments in Walker vs. Telex and IBM, Telex's former attorney Floyd Walker has dismissed IBM from the action.

Walker had filed for payment of $1.5 million he claimed Telex owed him for services rendered under his employment contract [CW, Oct. 11].

IBM had, however, filed suit against Telex in order to recover court costs it has already incurred.

IBM's suit has been settled, with Telex paying the firm $185,000, according to an IBM spokesman.

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Here's why Digital's PDP-11/70 is the fastest selling supermini in the world.

In the short time that the PDP-11/70 has been offered, Digital has shipped over 1,000 of them. Customer applications include everything from laboratory research and education to extensive communications and commercial transaction processing.

What makes the 11/70 so popular? There are almost as many reasons as there are users. In conversations with a wide range of customers, four major reasons are repeated time and again: throughput, reliability, software and Digital itself.

"We went to PDP-11s initially because no other systems offered the price/performance. User response was so enthusiastic that we added more terminals and expanded to the 11/70. Our users love it. Reliability has been exceptional."... D.H. Casagranda, Manager, Corporate Systems, ATCO Industries, Ltd.

The 11/70 is a very powerful computer, designed throughout to handle more data far faster than machines costing 5 times as much. It's supported by an outstanding selection of software. And since it's made by Digital, you can expect the highest quality, reliability and support services.

"We have a highly challenging mix of computing requirements. The 11/70 has come through with flying colors."... Loren Gilmore, Corporate Manager of Engineering and Process Control Systems, International Harvester Company.

If you're wrestling with a mixed bag of computer needs, the PDP-11/70's your machine. It has an impressive variety of operating systems, languages, data management facilities and applications packages. It can handle real-time, timesharing and batch in any combination at the same time.

"We chose the 11/70 because it had all the tools we needed for a heavy transaction processing workload. And it's lived up to all our expectations."... R.E. Umbach, Manager, Intercom Systems, Walgreens.

More and more organizations need a system that provides fast turnaround of up-to-the-second information to dozens of users simultaneously. The 11/70 gives it to them: the operating systems, the database tools, the communications and the raw operating speeds themselves.

"The 11/70's power was impressive, but it was primarily the software that sold us."... Mel Culp, Systems Services Manager, Allis Chalmers Power Systems, Incorporated.

The PDP-11/70 comes with a choice of three major operating systems — IAS, RSTS/E and RSX-11 — that fit just about any operating requirements. Several languages, like COBOL, FORTRAN, BASIC, APL, DIBOL and RPG-II. And various data management systems, including multi-key ISAM and the only CODASYL-compatible Data Base Management System available in its class.

"There were only two companies that had the communications capabilities we wanted. On all counts the 11/70 was superior."... Royle Vagle, Director of Data Processing, Cooperating School Districts of the St. Louis Suburban Area, Inc.

Digital is ahead of everyone in the area of data communication capabilities. There's the DECnet software that lets you communicate with a broad range of Digital computers, from micros to maxis, and a wide range of interfaces, terminals and services.

"Reliability was a critical requirement, and we got it. We've had only one machine failure in six months."... Charles Holmes, Manager of Computer Services, Farinon Electronics.

Up-time, in fact, was one of the major goals in the 11/70's design. It started with the selection of the most reliable components tested under worst-case conditions. And culminated in a system where operations are continuously monitored by hardware or software. If you do have a problem, the 11/70 diagnostics and packaging make it one of the most quickly serviceable computers on the market.

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Information Processing Drops on Forbes Industry List

NEW YORK — The median return on equity in the information-processing industry dropped the sector from seventh to 16th place in *Forbes Magazine's* annual ranking of industries.

Information processing, which includes copiers and office equipment as well as computers, had an average return on equity over five years of 12.6%.

The median return on equity for the 30 industries in the last 12 months was 12.9%. Computers were slightly under with 12.7%, while copiers and office equipment, with its 8.1% figure, dragged down the information-processing industry's average.

The industry's five-year average on return on working capital — 9.6% — ranked 13th.

Forbes said the median figures for the information-processing industry are less significant than for others since it is dominated by IBM and Xerox. "Both IBM and Xerox are doing fine, thank you, but their competitors are not doing nearly as well."

Sales for the information-processing industry grew an average of 13% over the past five years, earning a seventh place ranking.

DP Earnings Grow

The computer portion of the industry saw its per-share earnings grow an average of 11.7% in five years.

Looking more closely at the participants in the field, *Forbes* found several firms ranked the same in return on equity and in return on total capital for the five years.

IBM was first, followed by Hewlett-Packard Corp. (HP), Digital Equipment Corp., Burroughs Corp., Sperry Rand Corp., Honeywell, NCR, Control Data Corp. and Memorex.

But DEC led in both sales growth for five years and in earnings per share. Memorex was second in sales, followed by HP, Burroughs, IBM, CDC, Sperry Rand, Honeywell and NCR.

In earnings per share, second place went to Hewlett-Packard, then Burroughs, IBM, Sperry Rand, NCR, Honeywell, CDC and Memorex.

The range in return on equity spread from 20.1% to a deficit, while the growth in sales ranged from 36.5% to 9.5%.

Earnings per Share

In earnings per share, DEC and HP outdistanced the rest of the pack by a fair amount; DEC led with 29.1% and HP followed with 23.3%. The next entrant was Burroughs with 17%, according to *Forbes*.

Compared with other firms in the other industries, howver, IBM ranked only 113th in terms of return on equity for the five-year average and 44th in return on capital.

HP, which was second on the DP list, ranked 165th in return on equity and 63rd in return on capital. Texas Instruments was 234th in return on equity.

DEC ranked 311th in return on equity but 115th in return on capital and Burroughs 370th in return on equity.

DEC's rapid growth earned it a ranking of 62nd in earnings per share and 23rd in sales, according to *Forbes*.

Amdahl Enters Micro-Bit Effort

LEXINGTON, Mass. — Amdahl Corp. has taken a minority equity position in Micro-Bit Corp., a privately held company engaged in the development of high-performance computer memory devices.

Amdahl, which invested $500,000 during 1976, has a commitment to invest $1 million during 1977. It also has an option to invest an additional $3.5 million before Dec. 31, 1980.

In addition to stock in Micro-Bit, Amdahl will be granted licenses to manufacture and market certain of its products.

Others holding equity positions in Micro-Bit include Control Data Corp., Exxon Enterprises, Commercial Credit Capital Corp. and Sprague Electric Co.

Basic/Four Making CRTs for Its Systems

IRVINE, Calif. — Basic/Four Corp.has begun manufacturing a CRT terminal for its small business computers.

The move will "allow the company to achieve a lower cost and improved reliability," according to T.J. Smith, president.

Designated the Model 7230, the CRT is being manufactured under a licensing agreement with Lear-Siegler, who supplied earlier versions of the terminal.

Key Tronic Sues

SPOKANE, Wash. — Key Tronic Corp. has filed a countersuit against Controls Development Corp. and its parent company, Automix Keyboards, Inc., over patent infringement on a capacitative switch.

In response to an initial patent infringement charge by Controls Development, Key Tronic is requesting a declarative judgment that Key Tronic is not infringing on any such patent and that Controls Development's patent claim is not enforceable or valid against Key Tronic.

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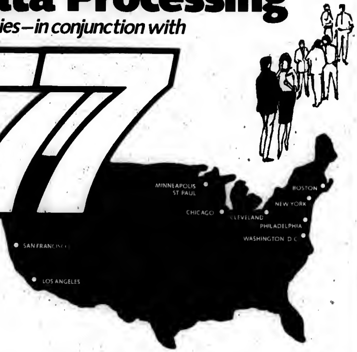

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Memos Show FTP Hurt PCMs

(Continued from Page 39)

back accounts from the PCMs. Figures compiled by Ralph A. Pfeiffer, president of the Data Processing Division, showed IBM 3330s and 2319s had replaced at least 300 PCM 2314-type drives while orders for the 3420 tape drive would replace 270 PCM tape drives.

A memo written at the end of June indicated most PCMs had countered with their own price decreases but that the FTP had slowed them. Memorex, for instance, was reported to have cut back production about 30% and decided to expedite development of its 3330-type drive, an IBM memo stated.

Greater Impact Than 2319

Memorex's Fitzgibbons said the FTP had a more dramatic impact than the 2319s on the PCMs. The FTP "locked us out of the marketplace."

IBM's decision to adopt the FTP, which was expected to result in reduced revenues for the first two years, was prompted by Chairman Thomas J. Watson Jr.'s April 1971 urging to "swallow the financial pills" and get the company ready for the future.

"We must return the company to a growth posture," he admonished.

Francis (Buck) Rodgers, vice-president of marketing, had written Watson a few days earlier saying that if the PCMs' replacement of 2314s continued at the March rate, PCMs would replace 37% of IBM's rental inventory by the end of the year.

The reasons for the popularity of the PCMs' products, IBM management repeatedly acknowledged, were equal or better performance at lower prices.

Although the FTP would cause a reduction in IBM revenues in 1971 and 1972, the firm predicted this would be more than made up by protecting the forthcoming 3330 disk from PCMs.

A study in May, prior to FTP, forecast reduced revenues in 1971 and 1972 of about $13.2 million and $20.3 million respectively, but a net increase between 1971 and 1975 of $411 million, principally from the $406.2 million IBM expected to realize from the 3330.

Reduced Profits Seen

But these reduced revenue projections disturbed Paul J. Rizzo, IBM chief financial officer, who on July 2 predicted the FTP would cut corporate profit by $102 million and urged management to raise prices wherever possible.

In answer to Rizzo, the Management Review Committee decided on July 9 to hike prices as much as 8% on 370 CPUs and 4% on 360s. Because of price control red tape, these were not effective until December, IBM attorney David Boies remarked.

The combined effect of the FTP and the CPU price hikes would be "a wash insofar as business volumes are concerned," according to the calculations of F.A. Powell, who was in IBM's Corporate Planning Group.

Other Countermoves

Other previous attempts to counter the PCMs included the 2319, described by J.D. Kuehler, head of IBM's San Jose Labs, as a "kluge:" It was not a new machine, he stated in August 1970, but repackaged 2314s.

Memorex's Fitzgibbons described the 2319 as "disheartening." There was no clear way to react except to lower prices, he said.

Memorex lowered the price of its 2314-type controller to about $600, which was very close to the break-even level, in order to keep its base installed, he said.

The firm was intent on making its business appear viable in order to prevent the financial community from losing faith in the company, he said.

The partial integration of the controller function and the accompanying difficulty of maintaining a mixed system made independents reluctant to market any portion of the 2319, Fitzgibbons said.

CCIA Asks FCC Stay Of Dataspeed Tariff

(Continued from Page 39)

what amounts to regulatory coin-flipping."

The order has the effect of preordaining the outcome of Computer Inquiry II in violation of its General Rules of Practice and Procedure, it continued.

The association's motion further contended the FCC's failure to render a stay of its order will cause irreparable injury to the CCIA's member companies because Computer Inquiry II may drag on for years.

During that time, AT&T will market the Dataspeed 40/4 and accrue revenues whch will be unrecoverable by competitors if the Inquiry dos in fact find the Dataspeed 40/4 an illegal offering, the CCIA claimed.

The motion contended the granting of a stay by the FCC will not irreparably injure AT&T.

Document in Calcomp Case Shows

GE Considered Attempt to Compete With IBM Too Risky

Although Reginald H. Jones, chief executive officer of General Electric Co. (GE), testified in the U.S. vs.IBM trial that no act of IBM forced GE out of the computer business [CW, Dec. 17, 1975], GE's Ventures Task Force report shows IBM's size and market position were considerations in GE's decision to sell its computer mainframe business.

By Molly Upton
Of the CW Staff

LOS ANGELES — General Electric Co.'s Information Systems Group's plan to make GE competitive with IBM was too costly and too risky for the firm, GE's Ventures Task Force (VTF) report stated.

GE was not prepared to finance the $500 million effort deemed necessary to make it a competitive vendor with a full range of products, according to the report, entered as evidence in the California Computer Products, Inc. (Calcomp) vs. IBM trial here.

The VTF thought the plan especially risky because gains in GE's market share were predicated principally on the assumption IBM would lose some ground to GE and not unveil a more sophisticated product that would impair GE's attempts to increase its base.

The report, prepared by Reginald H. Jones, then senior vice-president; R.M. Estes, general counsel; and J.B. McKitterick, vice-president of corporate planning, was delivered to the corporate executive office April 24, 1970 and was the basis for GE's decision to sell its DP equipment business.

The group was asked to recommend ways to make GE's newer ventures more consistent in earnings growth with the core of the company's business, related to energy equipment.

The losses from these ventures had nearly flattened GE's per share earnings growth, Jones said in the report.

Looking at the computer equipment area, the group found the gear was well along in its cycle and a major new investment would be needed.

But GE's information services weren't exempt from scrutiny. They were entailing higher losses than had been foreseen and would require additional investments, Jones observed in his report to management.

Problems With APL

The VTF looked at the Information Systems Group's plans for an Advanced ProductLine (APL) and concluded that "APL entails very high risks and . . . it is doubtful that it could be kept to time, cost and system performance schedules."

The APL plan, designed to put GE in the No. 2 slot behind IBM, represented a "full line" strategy calling for compatible computers and associated services "significantly (20% to 40%) superior to any available from IBM."

The APL plan also would have put GE "in direct confrontation with IBM," McKitterick observed.

"Even if General Electric were in a position to undertake such an ambitious program, we would not recommend that it invest the requested sums in such a hazardous project predicated on an all-out attack on IBM, one of the world's strongest corporations," Jones said.

"Faced with the lack of earnings growth, but seeking to retain its image as a growth company, GE cannot, in our opinion, undertake any half-billion-dollar venture, such as APL, that produces substantial immediate net income losses," he stated.

Jones later said the $500 million or $800 million required by the APL was "substantial in relation" to the firm's capital commitment in the business, which he estimated at $200 million..

Because GE had a sprawling, hard-to-defend installed base that was "already obsolete and vulnerable, time is not on our side," the report said.

But the answer for GE was not specialization, since GE with its diverse base "cannot fend off IBM with a specialized customer or mainframe approach because it would protect little, build on little," it continued.

Sizable Perils

The VTF was concerned that if GE brought out new equipment that "leapfrogged IBM, it would not be long before we were leapfrogged," Jones said in his testimony,.

The report pointed out sizable risks:

- "Obviously, the risks of a major shortfall in realization of these market objectives are enormous."
- "In addition, we face the probability that our APL will be technically inferior to IBM's product offering."
- "We hope to offset the expected hardware deficiency by software innovations of unprecedented difficulty."
- "Given the massive buildup of marketing resources, any slippage in our systems development timetable could have disastrous financial consequence."

In comparing GE's costs and resources with those of IBM; VTF found GE's manufacturing costs were 47% of revenues while IBM's were an estimated 20%.

GE had 4% of the market, IBM 70%. GE's DP cash generation was $.6 billion while IBM's was $2 billion.

But the APL plan's goal was to capture 7.1% of U.S. shipments by 1975 compared with 2.9% in 1969.

An implication of this goal was that APL would account for 10% of total shipments in its intended market and that IBM's total share of shipments would fall from 70% to 59% with GE capturing the largest share of IBM's loss, McKitterick observed.

GE should hold onto its information services business, the report recommended, for four reasons:

- "Projected losses not unduly burdensome."
- "Many potential buyers, as contrasted to equipment business."
- "Capitalizes on GE strengths in data communications."
- "GE has important presence and image in information business in fastest growing segment where we currently are the leader."

While the equipment business was expected to double in the next five years, a tenfold growth was forecast for the information services arena.

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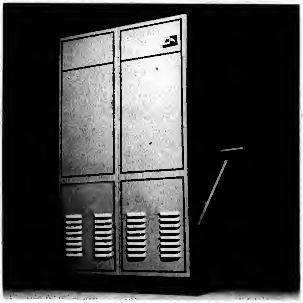

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Sycor Sued Over Prospectus

ANN ARBOR, Mich. — Sycor, Inc. has been served with a class action suit by a stockholder charging that its prospectus contained untrue statements or omissions of material facts regarding Sycor's foreign operations.

The suit was filed in the southern district of New York by Munsey Trust on behalf of purchasers of Sycor common stock between March 23 and Nov. 1, 1976. No specific amount of damages was cited in the suit.

A Sycor spokesman said the firm believes the suit is without merit.

During the week of September 20, Sycor dropped 6.5 points after the company revised downward its projections for the year as a reflection of an expected decrease in the level of foreign revenues.

Sycor said fall shipping schedules to its large OEM customer, Olivetti, were uncertain because of a disruption of sales in South America and year-end inventory planning.

Calcomp Eyes Stronger Floppy Position

By a CW Staff Writer

ANAHEIM, Calif.— Hank Meyer, director of small disk operations at California Computer Products, Inc. (Calcomp), has some schemes up his sleeve to improve Calcomp's position in the floppy disk marketplace.

Armed with a separate operating organization within Calcomp and its own profit-and-loss statement, Meyer intends to utilize the advantages of a big company along with newly gained responsiveness from a smaller organization.

Calcomp's service organization is being tuned to support floppies, he said. "This is an investment on our part which we hope will show our intent to be in this business in the long run," he explained.

Current industry practice is to return drives to the factory for repair. However, the Calcomp organization should provide either repairs or replacements from its local service arms, he said.

"The next round of competition will be in the service area," Meyer said, adding the increasing numbers of end users are going to expect high levels of service.

Small Company Response

In line with the competitive nature of the floppy disk business, the Calcomp reorganization was designed to enable the small disk unit to provide rapid turnaround and responsiveness — to function as a small company, Meyer explained.

The small disk unit has its own engineering, manufacturing, marketing and quality control sections.

Meyer characterized the reorganization as challenging and said he feels confident Calcomp can grow a business out of the floppy disk area.

In the long haul, prices, currently from erosion, will be more reasonable, he said.

Meyer plans to have a double-sided drive soon, perhaps by the second quarter, and is also moving into the systems business in the memory and graphics areas.

Currently, Calcomp does not make a host adapter, but does intend to make one for use in its systems, he said.

Meyer expressed concern about continued price erosion within this industry which, he said, is coming from firms with smaller bases as well as Shugart. Wangco is "aggressive" and Pertec is "determined," he said.

In OEM quantities of thousands of drives per year, a drive is priced under $350, he said. "Even at those volumes the price should be over $400 if the industry were mature" and companies were able to pay cost-of-living increases and perform R&D, he said.

Citing the immaturity of the industry, Meyer said customers don't seem aware that low prices may imperil suppliers. Buyers are getting second sources both as a means of procuring lower prices and also as a backup.

Meyer is concerned that other floppy vendors may be basing prices on the premise that they can optimize costs through volume. But volume production has a cost associated with it, he said, and requires a level of responsiveness that is of a different dimension from that associated with producing large disks.

The floppy disk industry will mature when other mainframes come in, he said, explaining they traditionally have demanded higher margins.

"I'd hate to see the industry go the route of the calculator," he remarked.

When there is little value in the drive, then the next trend is to move into the systems area, he said.

Calcomp will continue to sell to OEMs but recognizes that such sales are "not the lifeblood but rather a means of keeping production at a stable level. It also provides economics of scale," he said.

Service Matches DP Buyers, Vendors

ARLINGTON, Va.— A computerized marketplace for buyers and sellers of all types of electrical and electronic products has been formed by Industrial Marketing Advisory Services (Imas) here.

The clearinghouse for bids and quotes provides the buyer with the opportunity to shop the country for CPUs, peripherals, memories or any other type of computer-related equipment, according to Steven Dana, president.

One phone call sets the Imas machine in motion at no cost or obligation to the buyer, he said.

A buyer begins the cycle by calling a toll-free number with his purchasing requirements. An interactive answering system records his name, company and details of the order.

This information is then transcribed so it can be categorized, matched and sent out to Imas subscribers in the form of sales leads on a weekly basis.

Leads are currently segmented into product categories as well as regional categories, Dana noted.

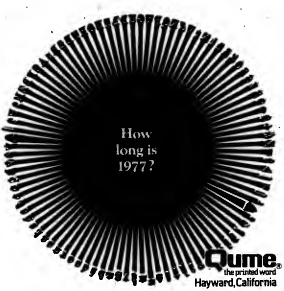
"Imas does not intervene in the selling process, but saves the buyer time and effort by searching all over the country for sources of supply," Dana said. "Subscribers then contact buyers directly.

"Most importantly, Imas increases the buyer's options and allows him to purchase according to his priorities: faster delivery, better price, etc.," he said.

The cost of the service is borne by the subscribers. A trial subscription of 50 sales leads is $75, Dana said.

Renewal is on a sliding basis with three options: 100 leads at $2 each, 250 leads at $1.75 each or 450 leads at $1.50 each.

Imas is at 2425 Wilson Blvd., Arlington, Va. 22201.



Contracts

Harris Corp. has been awarded a contract from Western Union valued at nearly $80 million over a three-year period for equipment to be used in a satellite communications system which Western Union will provide for the National Aeronautics and Space Administration (Nasa). Western Union received a $796 million contract from Nasa to furnish space communications from the new system over a 10-year period.

Aeronutronic Ford Corp.'s Space Information Systems Operation has been awarded a $400,000 contract by Lykes Brothers Steamship Co. for software development, implementation and evaluation of an equipment control system.

Microform Data Systems' Telephone Division has received a $408,000 contract from Telefonos de Mexico S.A. to install an on-line automated directory assistance system in Mexico City.

Kennedy Co. has been awarded a $1 million contract from Systems Engineering Laboratories, Inc. for Kennedy's Model 9300 magnetic tape transports and Series 9000 transports.

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Alternative to Bell

Prentice Expanding in Low-Speed Mart

By John P. Hebert
Of the CW Staff

PALO ALTO, Calif. — Prentice Corp. is expanding its place in the low-speed end of the data communications marketplace by offering alternatives to Bell Telephone's equipment, according to Peter Cregut, president.

Prentice has been offering the user "a multitude of ways to solve communications problems, with streamlined equipment and money-saving methods," Cregut said in a recent interview here.

The approach is helping the company to pull away from its collision with bankruptcy in January 1974 — a fact which is not well known, Cregut said.

There was no change in the continuity of business at Prentice between that time and October 1975, when the company obtained new financing to get out of the Chapter 11 proceedings, he noted.

Prentice is presently operating at a revenue level of $2 million, which should reflect $500,000 on the bottom line in April at the close of its 1977 fiscal year, Cregut said.

This past April, the 100% end-user-oriented firm had revenues of about $1 million and profits of about $200,000, he added.

In the future, however, Cregut predicted Prentice will reap benefits from an expansion in the low-speed communications area which, he said, should triple between now and 1985 for independent communications equipment manufacturers.

This expansion results from an absence of changes in the efficiency of that area in the past added business from small- and medium-sized users asking for low-speed communications capabilities in the future, he explained.

Prentice's future, Cregut said, will be determined by its ability to grow within a marketplace where prices are largely stabilized by IBM and Bell.

The privately held company's major growth areas include 1,200 bit/sec interactive communications, the line driver business and short-haul communications.

Bell's recently announced Single Message Rate Tariff (SMRT) will change the present method of dial-up interactive communications because users will be forced to utilize leased lines as a result of higher, time-dependent costs, Cregut said.

A user could, in the past, dial the CPU site and leave the line up all day, but now that would be too expensive, he added.

Bell's changes have benefited the low-speed end of the business and squeezed the high end at the same time by stimulating more competition, he said.

As a result, Prentice's most rapid growth will be experienced in short-haul, low-speed communications applications served by Bell- and IBM-compatible modems and frequency division multiplexers (FDM), limited range adapters and asynchronous and synchronous line drivers, he stated.

All these products evenly split the bulk of the company's business, he added.

Cregut noted the FDM opportunity is greater than is generally conceded because the FDM is not limited by the number of terminals on a communications line to determine the communication speed.

Prentice has been helping the computer end of large companies and organizations concentrate equipment in one place and let the phone companies play with handling the concentrated data communications from that equipment, Cregut said.

The purpose of this is to save the user money and time, Cregut added.

OEM, End-User Balance Aim Of HIS Level 6 Upgrades

By Esther Surden
Of the CW Staff

BILLERICA, Mass.— Honeywell Information Systems, Inc. (HIS) will continue to direct its Level 6 enhancements "in a balanced fashion toward OEM, system-builder and end-user market segments," according to David E. Booth, director of minicomputer marketing and programs.

Speaking at the introduction of the 6/43 recently, Booth said HIS believes that maintaining the balance between the volume-oriented OEM and end users oriented toward support services will keep the Level 6 price competitive.

The announced agreements with customers such as Industrial Nucleonics, Inc. in the automated controls area, Base Information Systems, Inc. (a subsidiary of Advanced Computer Techniques Corp.) in the word-processing area and a variety of organizations developing data communications, medical applications and other systems represent the OEM side of the scale.

A parts distributor, developing an inventory management network, and Citibank, developing a word-processing network, represent end users that have made a commitment to the systems.

In the display arena, HIS is looking for an average annual growth rate in the worldwide display terminal market ranging between 25% and 30% over the next five years, Pompa added.

Minicomputer revenues increased more than 25% over 1975's total at HIS, according to Lee E. Sheehan, vice-president and general manager of the U.S. Information Systems Group.

"We have taken orders for well over 1,000 Level 6 systems in the U.S. alone," Sheehan stated, adding that some of these orders represent development systems which are the "seeds of additional significant orders for this year and next."

The international contribution to the minicomputer business is sizable and by year-end should represent about 40% or 50% of the total minicomputer bookings, he added.

Orders & Installations

The Drug Enforcement Administration of the U.S. Department of Justice has ordered 300 data terminals with associated control unit equipment from Bunker Ramo Corp.

Gold Bond Building Products is installing a Measurex Corp. 2000 digital process control system.

Western Electric has ordered a three-processor C8500 message-switching system from Collins Commercial Telecommunications Division of Rockwell International.

Systems Development Corp. has ordered 17 Systems Engineering Laboratories 32/55 computers for use in a telemetry integrated processing system at Vandenberg Air Force Base, Calif.

Beacon Industries, Inc. has installed two disk drives, 8K of memory and a 400 line/min printer from Business Systems Technology, Inc.

Optical Research Associates has ordered a Slash 6 computer from Harris Computer Systems to be used in implementing its turnkey optical design package (Code V).

IMS, Inc., a computer systems design and development firm, has installed a Burroughs Corp. B7000 system for design, payroll and general ledger applications.

Security Trust Co. of Rochester, N.Y., has ordered a Commercial Loan Information System from Automated Financial Systems, Inc.

The *Honolulu Star-Bulletin* and the *Honolulu Advertiser* are installing T-4000 editorial systems from Tal-Star Computer Systems, Inc. for text processing.

West Bank and Trust, Green Bay, Wis., has ordered an Instant Transactions system from Instant Transactions Corp. of America.

Carter Associates, a computer services firm, has installed a Tandem 16 system for on-line client servicing in general accounting, manufacturing and marketing applications systems.

South Nassau Communities Hospital, Oceanside, N.Y., has installed a Burroughs B1726 system to be used initially for administrative operations including budgetary control, payroll, accounts payable, general ledger and accounts receivable.

American Hardware Supply Co. is installing electronic point-of-sale equipment valued at approximately $5 million, including 1,000 NCR 250 electronic cash registers equipped with tape cassette recorders.

Public Service Electric & Gas Co. of Newark, N.J., has ordered a Moore Systems, Inc. energy management system built around dual redundant computers that will store and process information from 38 remote pole-mounted terminals and one larger free-standing unit.

Mnemonics, Inc., a software and service firm, has ordered a Data General Corp. Nova 3 minicomputer system to provide market survey tabulation services for its clients.

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MISSISSIPPI STATE CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 508 Robert E. Lee Bldg., Jackson, MS 39202, up until 2:00 p.m. 2-28-77 for the following data processing equipment:

Request for Proposal No. 279 General request for proposal for keyboard activated data communication terminals consisting of varying speeds and capabilities. Separate bids should be submitted for hard-copy terminals, cathode ray tube terminals, printer devices, and graphics terminals. These bids will be used to purchase equipment for the State of Mississippi through 1977.

Request for Proposal No. 280 for the purchase or lease of modems or acoustical couplers for terminal communications with various computer systems used by the State of Mississippi; with speeds ranging from 110 baud to 19.2K baud to be used through 1977.

Request for Proposal No. 281 for the purchase of programmable electronic calculator systems to be provided to the State of Mississippi through 1977 ranging in price from $1500 to $15,000.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Clyde P. Ballard, Executive Director
Central Data Processing Authority

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Univac Sees Industry Growing 16% in '77

BLUE BELL, Pa. — The computer industry will continue the high rate of growth in 1977 that has characterized the industry throughout most of the past decade, according to Univac.

The firm is projecting that gross shipments by all manufacturers worldwide in 1977 will reach a value of $13.7 billion compared with $11.9 billion in 1976, representing a 16% growth rate, Gerald G. Probst, president, said.

"Although some countries are currently undergoing lower growth rates in their Gross National Product than heretofore, our experience has shown that the computer market is not necessarily similarly affected," he said.

"On the contrary, the influence of inflationary and recessionary forces often induces business and industry to invest in replacing older DP equipment to take advantage of newer systems offering greater cost-reducing capability," he said.

Over the next 12 months Univac should continue favorable growth in both revenue and profits, he predicted, with significant contributions to growth coming from large-scale systems and intelligent terminals.

In addition, the newly introduced Univac Distributed Communications Architecture along with its product offering should receive widespread attention from the distributed processing marketplace, he forecast.

"One of our prime strategies is to expand on our existing customer base," Probst said. "Accordingly, we will continue to allocate a considerable part of our resources to building up this base by providing compatible follow-on systems in our product lines for current customers.

"To attract new customers, we will maintain our policy of emphasizing price/performance and ease of conversion."

New Areas of Business

Univac expects to expand its business in new geographic areas such as the USSR, East Europe, the Middle East and South America.

Corporate plans also stress internal growth by pursuing selected markets and applications and by increasing the productivity of all operations as well as through acquisitions to complement the firm's expansion.

"Joint ventures along the lines of the successful Saab Univac company in Scandinavia and Nippon Univac Kaisha and Oki Univac Kaisha in Japan are other methods we are employing to achieve our growth objectives," Probst commented.

Turning to selected market areas, he said "the state and local government marketplace continues to be one of our strongest growth areas as local authorities strive to cope with inflationary increases in budgets for services by automating an increasing number of functions.

"Illustrative of this trend, we recently received very large orders from state government employment agencies in Ohio, North Carolina and Massachusetts. In each state, the computer will be concerned with matching unemployed persons with available jobs," he said.

Univac also expects to capture a larger share of the supermarket industry checkout systems business with enhanced scanning and key entry equipment.

"Even in those areas where unit pricing is mandated, supermarkets are achieving significant economies in terms of better inventory control and greater management information from checkout terminals linked to computers," Probst said.

Probem Areas

"Although we are optimistic about the outlook for calendar 1977, we should mention certain problem areas," Probst said.

"These include the continuing currency devaluations in many foreign markets which have affected our profits. Moreover, the twin evils of inflation and recession continue to affect the rate of western Europe's economic recovery.

"Even in the U.S., there has been a noticeable pause in the pace of general business activity. However, we believe that this is only a temporary lull and the business environment will rebound during 1977.

"In spite of these pressures we expect Univac's business to continue to prosper and grow," Probst stated.

Centronics Gets French Nod

HUDSON, N.H. — Centronics Data Computer Corp. has received permission from the French government to form a subsidiary in France to be known as Centronics Data Computer S.A.

The new firm will assume responsibility for the sale, service and support of Centronics' printers and teleprinters in France and North Africa. A spare parts depot and technical support group will be based at the same offices in Paris.

Maintenance service is already available throughout France.

The French office will be Centronics' third European subsidiary to be established over the last 16 months, with existing subsidiaries operational in the UK and West Germany.

"The establishment of our French subsidiary will mark an important step in developing our business in France," according to Max Hugel, executive vice-president of Centronics.

"We are already receiving a most favorable response from our present French customers and we have substantially improved our market opportunities for expanding our French customer base," he added.

Executive Corner

- Stephen R. McKenzie has been named vice-president of financial marketing for TRW Communications Systems and Services.
- Warren A. Wasson has been named vice-president of marketing for Action Communication Systems, Inc.
- W.W. Beairsto has been named executive vice-president and chief operating officer of Systems Dimensions Ltd.
- Haig Bazoian has been named vice-president of marketing and Robert Ruebel, vice-president of strategic planning, for Xerox Computer Services, a unit of Xerox Corp.
- O.C. Boxall has been elected a vice-president of Data Card Corp. by the firm's board of directors.
- Donald A. Bigger has been appointed vice-president of System Development Corp.'s government systems.
- Pierson Holcombe has been appointed marketing manager/computer products of the Norden division of United Technologies.
- John H. Underwood has been appointed director, sales and marketing, micro-mini products for Fabri-Tek, Inc.
- Walter Ciecierski has been appointed director of engineering for Stelma Telecommunications.
- John L. Charlton has been named director of marketing and Kenneth R. Bacus as national sales manager of Wabash Tape Corp.
- David J. Long has been appointed director of technical marketing for the Datawest Corp.
- Edward J. Heinze has been appointed national sales manager of Ontel Corp.
- Peter J. MacDonald has been appointed general manager of the electronic components division of Burroughs Corp.'s Federal and Special Systems Group and Gary Y. Buehler as manager of field engineering for the group's Standard Products Division.
- Chuck Clemente has been appointed manager of marketing communications of Centronics Data Computer Corp.
- B. Allen Lay will assume the responsibilities of general manager of the business systems division in addition to his role as senior vice-president, general manager for the CMC group of Pertec Computer Corp.
- Gordon D. Christiansen has joined the Amacon, Inc. staff as vice-president of engineering.
- Raymond V. Sozzi has been named vice-president of Genesis One Corp.'s wholly owned subsidiary, Management Assistance, Inc. (MAI).
- Larry Martin has been named vice-president of information services by Keane Associates, Inc.
- J.F. Magosin, Jr. has been elected vice-president of marketing by Automated Financial Systems, Inc. (AFS).
- Ronald O. Huch has resigned as vice-president of planning for Centronics Data Computer Corp.
- Serge Blinder has been appointed vice-president of marketing; William H. Gallagher, vice-president of development; Robert W. Howe, vice-president of operations and Phillip J. Legro, vice-president of finance for Savings Management Computer Corp.
- David Adams has been promoted to vice-president of sales for the ACTS Computing division of Lear Siegler, Inc.
- Lloyd D. Baldwin has been promoted to administrative vice-president of Pansophic Systems, Inc.
- Howard Wasserman has been appointed vice-president of marketing for Unitrode Corp.

Nickels & Dimes

Bolt Beranek and Newman has declared a semiannual dividend of 10 cents payable March 1 to holders of record Feb. 14.

$$$

Scientific Software has extended the warrants to purchase its common stock until Jan. 5, 1980. The warrants were to have expired on Jan. 5, 1977.

$$$

National CSS has instituted a program to repurchase up to 15,000 shares of its common stock. These treasury shares will be used exclusively to fund the firm's nonqualified stock option program and/or its qualified stock purchase plan for employees.

The acquisition period is expected to extend until Feb. 28.

Datum's, third-quarter loss of almost $1.2 million stemmed from a $1.3 million write-off of inventory, intangible assets and adjustments for cost overruns of several contracts.

$$$

Entrex has completed a $5.88 million private placement with a group of institutional investors. Proceeds will be used to finance leasing operations and the anticipated growth of the 600 series and to expand domestic marketing operations.

$$$

Compuscan has added more than $3.3 million to its current order backlog for optical character recognition equipment, raising its backlog to $8.1 million compared with $5.6 million a year ago.

Earnings Reports

DIGILOG SYSTEMS
Year Ended Sept. 30

	1976	1976
Shr Ernd	$.51	.....
Revenue	2,503,951	61,693,010
Tax Cred	152,000	.....
Earnings	344,033	(440,243)

DIGITAL EQUIPMENT
Three Months Ended Oct. 2

	1975	1975
Shr Ernd	61.29	$.95
Revenue	204,642,000	140,456,000
Earnings	15,705,000	11,390,000

DOCUTEL
Three Months Ended Sept. 30

	1975	1675
Shr Ernd	$.20	$.17
Revenue	8,257,000	7,362,000
Tax Cred	254,000	194,000
Earnings	511,000	432,000
6 Mo Shr	.70	.25
Revenue	24,937,000	19,627,000
Tax Cred	698,000	266,000
Earnings	1,611,000	640,000

ELECTRONIC DATA SYSTEMS
Three Months Ended Sept. 30

	1978	1975
Shr Ernd	$.25	$.29
Revenue	36,705,000	32,085,000
Earnings	3,297,000	3,516,000

ELECTRONIC TABULATING
Nine Months Ended Sept. 30

	1976	1975
Shr Ernd	$.75	$.59
Revenue	2,507,177	2,366,701
Earnings	321,396	252,360

DATA 100
Three Months Ended Sept. 30

	1675	1975
Shr Ernd	$.31	$.61
Revenue	30,176,000	24,636,000
Revenue	67,697,000	87,895,000
Tax Cred	373,000	760,000
Earnings	1,147,000	1,647,000
9 Mo Shr	.95	1.35
Tax Cred	658,000	2,038,000
Earnings	3,525,000	4,840,000

PERKIN-ELMER
Three Months Ended Oct. 31

	1976	1975
Shr Ernd	$.26	$.20
Revenue	65,300,000	78,183,000
Earnings	4,789,000	3,785,000

UNITRODE
Three Months Ended Oct. 31

	1975	1975
Shr Ernd	$.23	$.15
Revenue	7,827,704	6,824,518
Earnings	574,850	376,665
9 Mo Shr	.53	.51
Revenue	22,653,316	20,636,776
Earnings	1,562,277	1,246,643

COMPUTER ELECTION SYSTEMS
Three Months Ended Sept. 30

	1678	1675
Shr Ernd	$.76	$.25
Revenue	5,241,175	2,046,364
Earnings	990,265	318,468
6 Mo Shr	.66	.11
Revenue	6,266,663	2,466,447
Earnings	613,748	129,329

POSITION ANNOUNCEMENTS

COMPUTER PROGRAMMER/ANALYST

Growing EDP department with Dual B/4700's and heavy DCOM requires experienced programmer analyst to meet increasing demands of large Cleveland medical center. Successful applicants must have at least 2 years post high school education in data processing and 2 years programmer/analyst experience. Burroughs medium system experience preferred. Call collect, or send resume to:

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If you are a programmer programmer/analyst, systems analyst, or EDP professional and would like the most individualized job search offered in the data processing field today on a local or national level, forward your resume, with present salary and geographical preference, in strict confidence, to:

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Requires degree in Chemical Engineering, Chemistry, Math or Statistics with experience in process simulation, mathematical modeling and statistical applications. The person we seek will have at least 3 years of industrial Fortran programming experience and a strong ability to communicate and get along with others. Salary commensruate with experience.

Interested applicants should send resume including salary history and requirements to:

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Rand Corporation, a leader in research applied to national problems, seeks a senior systems manager to assume management of all facets of control system design and implementation for the corporation's computing facility. Responsibilities include technical leadership of 10 system programmers supporting a MVT/HASP based 370/158 migrating to MVS, a PDP11/70-11/45 facility utilizing UNIX, a node on the ARPA network, and a WYLBUR online and RJE system. Currently planned are the installation of an AP and TSO.

Qualified candidates will possess a degree in Computer Science or related field and extensive experience in all aspects of control system programming including MVT/HASP and online systems. MVS experience helpful. Supervisory experience of a minimum of 5 system programmers required.

Send resume establishing qualifications, full employment and earnings history, and salary requirements to Kenneth R. Logan.

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We currently have several excellent opportunities available for technically skilled software support professionals in the areas of:

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- Data base management
- Operating systems (TOPS-10 and TOPS-20)

Solid technical knowledge and experience in the above areas is desirable.

You'll be supporting our DECsystem-10, DECsystem-20 and networks field specialists worldwide, primarily solving customer problems either at our Marlboro facility or on site. In addition, you'll interface with users, technical, marketing, and development personnel and will solve user problems based on technical requirements. If you appreciate a real technical challenge and are growth and result-oriented, this is the position you've been waiting for.

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In this high-visibility position, you will be a major contributor to the internal planning of our systems software, primarily DECsystem-10, DECsystem-20 and networks for both large systems and minicomputers. You will be responsible for establishing plans and strategies for the support and maintenance of our software products:

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- Propose and implement product support plans.
- Strong interface responsibilities with home office and field management.

A technical background and planning/managerial experience is desirable for this position.

Representatives of Digital Equipment Corporation will be at the Association for Computing Machinery Conference at a midtown hotel in Atlanta, Georgia, on January 30-February 2, 1977 to conduct interviews for the above opportunities. For an appointment, please call (404) 659-7118 during the aforementioned times.

If unable to meet with us at this time, please direct your resume to Carol Reed, Digital Equipment Corporation, 200 Forest Street, Marlboro, Massachusetts 01752.

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McClatchy newspapers, a multi-plant group of newspapers with radio and television stations, has challenging position at corporate level in Sacramento for data processing manager with strong experience and supervisory background. Should have minimum two years supervisory experience in medium sized DP shop with 3rd generation equipment. Good salary plus liberal vacation, medical and retirement benefits. All replies held in strict confidence. Send detailed resume including availability for personal interview to:

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- IMS Data Base Management
- CICS On-Line Systems

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Computer science professional with three or more years of real time programming experience using ALC on large scale and 16-bit mini-computers. You will be involved in program development, design, and analysis for large scale multi-tasking systems in advanced technology electronics. If you have had actual experience in product software programming, have a stable employment history, and a record of professional achievement, mail your resume today.

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PROGRAMMER SOFTWARE SUPPORT

Addition to staff has created a challenging position in our System Support team. Experience in the internal code and control of OS/MVT, IMS, VM, UCC/20, TSO or DOS would help an individual in learning this job.

This position is at our corporate offices in Minneapolis. Starting salary based on applicable experience. Excellent fringe benefits including air travel. Send detailed resume or call (612) 726-7668.

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Municipal Analyst/Programmer

Startup computer installation seeks a designer/implementor to computerize a variety of interlocking systems. Accounting, programming, and systems design experience required. Dynamic environment needs a hard working problem solver, communicator, educator and diplomat. Two years of business programming and design experience expected. Accounting degree and online/DBMS experience highly desired. Salary $18-20K.

Consulting Systems Analyst

Technically creative self-starter needed for one-year assignment. Possibility of continuation may be earned. Initially will travel to NYS cities to analyze and document payroll/personnel applications. Subsequently will produce detailed specifications and develop local payroll/personnel system, etc. Require polished communications skills — including documentation design, and analyst/programmer expertise (3+ years). Salary $18-20K.

Resumes with salary history by
February 4, 1977
Gerald F. Johnson
Director of Finance
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- Network Design and Communications Control for Distributed Processing Systems.
- Minicomputer Hardware/Software Design Trade-off.
- Terminal and Peripheral Interface Design.

NETWORK DESIGN

- Node Control
- Distributed File Management
- Terminal Handling
- Computer Communications

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2 or more years experience with emphasis in:

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- BSEE degree with minimum of 3 to 5 years experience.
- Familiar with Fortran, Logic Simulation, Systems Simulation, and P.C. Board Design.

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A degree in engineering, computer science or equivalent is required with preference being an advanced degree. An MBA would be a substantial asset. Applicant must have strong systems orientation and substantial experience with communication systems. In-depth knowledge in one or more of the following areas are desired:

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- Communication processor architecture.
- Communication link disciplines.
- Communication systems diagnostics.

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Primary job responsibilities include serving as Senior Analyst/Programmer in design, programming, and implementation of On-Line Student Registration System on a UNIVAC 9450 with IMS-90. Minimum of 3-4 years of recent Cobol programming and System Analyst experience required. Basic RPG and BAL desired, but not required. Bachelors degree preferred. TP experience a definite asset. Salary to $16,800, depending on education and experience. Application deadline: February 28. Direct inquiries to Assistant to the President, Odessa College, Odessa, TX 79760; (915) 337-5381, ext. 352.

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SYSTEMS ANALYST
University of Northern Iowa

Assists administrative staff in defining their information processing needs; designs data processing systems for their information needs; writes programs and oversees programs of the programmer analysts assigned to the projects.

Qualifications for position: Computer Science, math, or Business related degree with a minimum of three years of experience with COBOL and IBM OS-JCL. The hiring salary range is $14,500 to $17,000 depending upon training and experience; an excellent fringe benefit program is available.

All interested and qualified applicants should submit their letter of application and resumes complete with salary requirements to Dick Cottrill, Associate Director, Personnel Services, University of Northern Iowa, Cedar Falls, IA 50613 prior to February 15, 1977.

The University of Northern Iowa is an EEO/AA employer. Members of the protected classes may identify themselves for purpose of Affirmative Action.

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Hardware/software experts to help build new computers to match the world's best software.

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The development of two new Sigma computers. They will extend the line's capabilities well into the 1980's and take full advantage of Xerox' state-of-the-art CP-V and CP-R operating systems . . . software that the latest Datapro Research survey* shows as ranking first in the world.

Sigma 9 computer

- Will be micro-programmed
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- Full production by 12/78

Sigma 11 computer

- 4 X faster than present Σ9
- One-half the price
- ECL logic
- Full production by 12/79

All standard Telefile and Xerox I/O processors, main memory, and peripherals will be plug-compatible with both machines

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- Programmers (All Languages)
- CP-V and CP-R Analysts
- Firmware Designers
- Comp. Architecture Designers
- Semi and Core Memory Designers
- ECL Logic Designers

Only highly qualified applicants need apply for this exciting new venture with a computer company that has shown an average annual growth of over 50% five years in a row. Send resume and salary history to:

Mr. S. V. Edens, President
Telefile Computer Products, Inc
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Telefile

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*Computerworld, December 6, 1976

FLORIDA

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We are a leading, worldwide consulting company with an outstanding record of providing facilities management to federal, state and local governments and to private industry.

We seek a Senior Data Processing Marketing Specialist to enhance our corporate staff. This person will be currently successful in developing data processing marketing plans, programs and strategies for city governments throughout the United States.

This position is based in California with substantial nationwide travel. A basic compensation package in the area of $40,000 plus incentives is anticipated for the qualified candidate. Our requirement is immediate.

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SYSTEMS ANALYSTS/ SCIENTIFIC PROGRAMMERS

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Growing company has excellent opportunities for individuals with degree in engineering, mathematics or equivalent experience to work on state of the art interactive design drafting system.

Successful candidates must have experience in machine language and higher level language on digital scientific computers. Background in data base design, computer graphics or time shared operating systems an asset.

Excellent starting salary, ideal professional environment and full fringe benefit program. Relocation expenses paid to this ideal area for living and working.

To arrange confidential interview send resume to:
Watson Peterson, Jr. . . . Director of Personnel

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Systems Programmers

Avco Computer Services, one of the largest and fastest growing computer centers in New England, is seeking professional programmers experienced in any of the following areas:

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Challenging and rewarding operating system work will be offered to imaginative people on a loosely coupled 2 megabyte 360/75 - 4 megabyte 370/158 multiprocessing system.

Avco offers a liberal benefit program and excellent salary commensurate with your educational and professional background, in addition to aid for advanced education.

Kindly send your resume, including salary requirements, to:
Mr. Peter C. Dowd,
Employment Supervisor

AVCO COMPUTER SERVICES
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We have an urgent requirement for programmers & analysts with a good knowledge of the above, for varied work with the American subsidiary of a large British Software House.

CALL: Miss Sally Summers
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ACS AMERICA INC

EDP MANAGER

Distribution Company located in Waltham, Mass. needs a hands-on manager to supervise its DP activities and to assist in further developing its on line system. Knowledge of IBM System 3, Model 15, RPG II and CCP desirable. Salary range is negotiable depending on individual's qualifications. Inquiries will be held in strict confidence. Send resume to:

CW Box 4882
787 Washington St.
Newton, Mass. 02160

Information System Specialist

On-Line System Administration

Kaiser Foundation Medical Care Program is seeking an exceptional individual to support the design, development and implementation of large scale, data-base telecommunication application systems. If you are ready for greater challenge and responsibility and possess most of the following criteria, then we would like to talk to you.

Proven track record as a senior of a staff of data processing professionals who have developed data base telecommunication systems which are successfully operational. Currently working in an IBM 370 OS/BS IMS database CICS structured programming environment. Strong leader, people motivator and effective communicator at all levels in the organization. Fundamental business knowledge and attitude.

We offer an excellent starting and above average fringe benefit package. For immediate consideration, please forward resume, with salary history and requirements to Personnel Supervisor, Dept. SR-10, P.O. Box 12916, Oakland, CA 94604. We are an equal opportunity employer, m/f.

Kaiser Permanente

New Careers in Software

San Francisco Peninsula

The creation of our new Software Technology Department in Special Programs Operation at Ford Aerospace and Communications Corporation has resulted in a need for a number of senior analysts or computer systems specialists. The individuals we are looking for will have advanced degrees and/or three years' experience in one or more of the following disciplines:

- Software engineering/software development methodology
- Data base management/distributed processing
- Image processing
- Minicomputer based systems (PDP 11, SEL 32, Eclipse)
- Computer networking/ARPANET protocols
- Microprocessor software development
- Operating systems (UNIX, RSX 11D)

We offer outstanding compensation and benefits packages, coupled with the opportunity and challenge of working in this new area. For immediate and confidential consideration, please forward resume and salary history to Professional Employment, Dept. JJL-1.

Ford Aerospace & Communications Corporation

Western Development Laboratories Division
3939 Fabian Way
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PROGRAMMER/ ASSEMBLER

A programmer with a minimum of 2 years of assembler experience, who aims at extending his or her professional capabilities in a high challenge environment, should check out RJR's opportunities for several reasons.

- One is diversity. As a Fortune 500 corporation, RJR is heavily involved in many growth industries, including food, tobacco, metals, transportation, packaging and petroleum.
- Another is our commitment to maximizing the ways in which our computer facilities can be utilized, which means multiple applications ranging from marketing to process control to warehousing, using 370/158's and 145's.
- And the value we place on EDP skill is demonstrated by the salary structure in this area and the excellent benefits package that accompanies this. We are situated in one of the most attractive living areas on the East Coast.

Planned growth is creating new openings for assembler programmers with experience in on-line programming, a working knowledge of DDS and/or OS, and the respective control language. A degree or comparable experience is desired.

If you qualify, we'll be pleased to talk with you. Write, in confidence, including resume and salary requirements, to: Mr. Denis C. Simon, Manager of Employment, R.J. Reynolds Industries, Inc., 401 North Main St., Winston-Salem, N.C. 27012.

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We are designing & implementing an integrated data base system on IBM 370 hardware. We are seeking key professionals with the ability to work with an international consulting firm. We need the following classifications to join our development team:

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SYSTEM ANALYST
SR. PROGRAMMER
PROGRAMMER

We are using OS/VS1, IMS, CICS, COBOL. Opportunities for advancement are above average. Opportunities for professional growth are tremendous. Salary & benefits are competitive. Job located in Houston, Tx. Please reply in confidence to:

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Equal Opportunity Employer

COMMUNICATIONS PROGRAMMER

Sycor, Inc., a dynamic, young company and a leading manufacturer of intelligent terminals, has a growth-oriented opening in the Ann Arbor area for a Communications Programmer.

Minimum three years experience in real time programming. Experience with IBM communications access methods (BTAM, TCAM, VTAM, etc.) and communications oriented control programs (CICS, etc.) also desirable. At least BS in Computer Science or equivalent is needed, but MS preferred.

Please send resume and salary history to:

Gopi R. Jindal, PhD.
Manager, Professional Employment, Sycor, Inc.
100 Phoenix Drive
Ann Arbor, Michigan 48104

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Dallas, Texas 75207

DETROIT
Electronic Systems Personnel
1705 Fisher Building
Detroit, Michigan 48202

FLORIDA
Data Sciences Personnel, Inc
Suite 205, 15490 N.W. 7th Ave
Miami, Florida 33169

HARTFORD
Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105

LOS ANGELES
Constellation Enterprises
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Los Angeles, California 90010

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Minneapolis, Minnesota 55402

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Greensboro, N. Carolina 27405

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Systems Personnel
207 Fox Lane
Wallingford, Pa. 19086

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428 Forbes Avenue
Pittsburgh, Pennsylvania 15219

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San Francisco, California 94111

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TULSA
Data Processing Careers, Inc.
Suite 10, Park 21 Building
2828 East 21st Street
Tulsa, Oklahoma 74114

WASHINGTON, D.C.
ESP Systems Corporation
Suite 218
1211 Connecticut Avenue N.W.
Washington, D.C. 20036

Computer Personnel Firms interested in NCA Membership, write to: J. McNamara, 2990 W. Grand Blvd., Detroit, Mich. 48202

GRAPHICS SYSTEMS

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(203) 278-7170

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The City of Tacoma, a progressive northwest city, is offering a challenging opportunity to manage a systems & programming staff of 24 persons with complete responsibilities for new project development, systems maintenance and systems programming.

Desirable qualifications for this position include a college degree, an operations as well as a systems background, experience with IBM computers and experience in municipal data processing applications.

Applicants should have a minimum of five years data processing experience with demonstrated managerial capabilities. Management style should be results oriented and excellent communications skills a must.

The City of Tacoma provides a comprehensive fringe benefit package and the salary range for this position is $1,800/month to $2,187/month.

Qualified candidates should submit their qualifications, employment and salary history, and references no later than February 4, 1977.

To: City of Tacoma
Personnel Department
Room 531
County-City Building
Tacoma, Washington 98402

Equal Opportunity Employer

MANAGEMENT INFORMATION ANALYST

$18,000-$20,000 Annually

Opportunity for an experienced analyst to develop on-line, data based municipal systems. Analyst will be working on a mini-computer using a DBMS with Query and COBOL. Requirements include an accounting, business or math major with a minimum of 3 years EDP systems experience. Mountain View is near Stanford University in the San Francisco Bay Area. Final filing date is February 14, 1977. Send resume to City of Mountain View, Personnel Office, P.O. Box 10, Mountain View, CA 94042 (415) 967-7211, EXT. 273.

DP OPPORTUNITIES

If you are interested in the Washington, DC area, the following are a few of the opportunities awaiting you.

IMS P/A, OS	To $22K
CICS, COBOL or ALC	To $20K
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Call or mail your resume in confidence to Don Richard Associates, 7315 Wisconsin Ave., Ste. 726, Washington, DC 20014 (301) 652-1182. All positions fee paid.

SENIOR PROGRAMMER ANALYST PROGRAMMERS

Union Planters National Bank of Memphis, the Southeast's leading bank in the field of EFT and POS, is seeking DP talent to add to its staff of computer professionals. Union Planters has immediate openings for programmers and Senior Programmer Analysts in its large IBM 360/OS MVT installation. Experience with COBOL and OS environment is required and additional experience with IMS and assembler is desirable. Programmers should have 1-2 years experience and Senior Programmer Analysts should have at least 3 years experience as indicated above. Salary commensurate with experience.

Submit resume and salary history in confidence to:

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Personnel Services
P.O. Box 387
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DATA BASE ADMINSTRATNOR

We are a progressive leader in the health care field with excellent opportunity for an individual with 2-3 years data processing experience in a large scale IBM 370/168, 158) OS/VS environment.

Experience in systems programming or technical support, and some IMS background is also desirable for this position. Responsibilities will include data base design and implementation, monitoring and evaluation of DBMS, and specified involvement in the technical aspects of IMS.

If you are looking for a challenging opportunity to expand your data processing background, consider joining us in an exciting future. We offer an excellent salary and a complete benefit package.

Send resume and salary requirements to:

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4115 No. Teutonia Avenue
Milwaukee, Wisconsin 53201

Technical Support Specialist

Intersil, recognized for its achievements in developing a broad spectrum of semiconductor devices seeks a talented technical support specialist for our Cupertino, Calif., headquarters.

To qualify, you should have IBM systems 360/370 hardware support experience plus thorough knowledge of IBM CPU diagnostic useage. Working knowledge of software and/or training helpful.

For immediate consideration, please send your resume to Intersil Employment, 10900 N. Tantau, Cupertino, CA 95014. An Equal Opportunity Employer M/F.

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DATA PROCESSING: TRAINING COORDINATOR

Could You Establish and Administer A Training Program In An OS/MVT Environment?

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FOR IMMEDIATE AND CONFIDENTIAL ATTENTION, PLEASE DIRECT YOUR RESUME TO:

Perry W. Turner
Personnel Manager
(205) 956-8020, ext. 363
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CARS, INC.

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Administrator, Computer Control Systems

A position in the computer controls area of material handling systems, using state-of-the-art technology; must have experience with both computer hardware and software products; systems analysis, design, development and installation of automated systems.

Individual must be highly self-motivated, comfortable with detail, capable of working with little supervision, ability to interface with and coordinate various departments, vendors and customer personnel. Responsible for both pre and post-sales activities.

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Experience in material handling and mini-computer systems desirable; real time software and control electronics hardware; computer sizing and project time estimating are a plus.

Senior Programmer/Analyst

A position for a person with experience in design, development and installation of computer control systems; real-time applications; FORTRAN and assembly languages; mini-computer hardware and software. Must be customer oriented and experienced in dealing with customer problems.

Degree in engineering, business or computer sciences plus a minimum of 6 years programming experience in data processing and sensor based systems.

Location is Eastern Pennsylvania and positions will involve a nominal amount of travel.

Send resume to J. Magee, Personnel Manager, P.O. Box 70, Easton, Penna. 18042

SI HANDLING SYSTEMS, INC.

Equal Opportunity Employer M/F

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data processing

case

SR. TELEPROCESSING SYSTEMS PROGRAMMER
SR. MVS SYSTEMS PROGRAMMER
IMS SYSTEMS PROGRAMMER

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For consideration, you must have programming experience on a large IBM OS/VS system. Experience in MVS desirable, degree preferred. Present equipment offers software MVS/IMS technology and TCAM + BTAM teleprocessing with scheduled conversion to VTAM sometime next year. Hardware now in use consists of IBM 370/168 with remote terminals; 3270, 3790, 3600, 3741, and 3770.

Excellent package of compensation including top benefits package and ample opportunities for growth and professional development. Submit resume, in confidence including salary history to: Mr. C. Hertwig.

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EDUCATION:	BSEE, Computer Science or Math desired.
SALARY:	$20,000-$22,000
COMPANY:	12 years old, $25 million annual sales.
CONTACT:	Clay Hemlin

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(603) 893-4511 or (617) 729-0660

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As a computer professional you are aware of our reputation for excellence and phenomenal growth. In Atlanta, we'd like to get to know you — the top talent in our industry. Managers of our Software Development Group will be there to describe the exceptional opportunities available to those who qualify for our highly professional team which is involved in designing the next generation of INTERDATA's software. According to your level of expertise in Software Development Including Operating Systems, utilities, data communications, networks, languages, diagnostics, etc. you will lead or become a member of our professional team.

Introduce yourself to INTERDATA by visiting our Hospitality Suite at the HYATT REGENCY Atlanta in Peachtree Center and ask for Bill Baattie, or call him on our Employment Hotline — (404) 575-1760 during the Conference, any day, any hour!!

If you can't make it or call, send your resume in strictest confidence.

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Tektronix, a world leader in the electronic measurement and computer graphics markets, offers you a unique opportunity in support of a rapidly expanding microprocessor-based line.

We have immediate sales positions open throughout the U.S. and will provide you with both product and sales training.

Applicants should have a current knowledge of digital hardware design and software experience, in addition to a strong interest, aptitude, or successful experience in professional sales. A BSEE or equivalent experience in microprocessor-based systems is desirable.

In addition to a competitive salary base, sales incentive programs and automobile, we offer a comprehensive benefits program which includes medical, stock purchase, educational and retirement programs.

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Rockville, Maryland 20850

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NCR Century 200. Experience preferred. Cobol and/or Neat/3 language.

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The general assignment will be to implement, maintain and enhance operating systems and support software. Emphasis will be not only on meeting management needs, but also on back-up and recovery procedures to assure against serious failures, diagnostic and problem analysis, and continuing effort to improve utilization of equipment and efficiency. At least 3-5 years of pertinent experience is required with minimum of 1 year hardware/software support, in an OS or OS/VS environment. A BA in Computer Science is desirable. Salary high teens.

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Able to Evaluate Adequacy of Controls Within Computer System

Responsibilities will be in the areas of evaluating policies, procedures, and systems design as they affect the security and reliability of controls built in to provide proper protection against error, interference, or abuses.

Evaluations will be performed routinely with respect to any change or addition in accounting or information systems, and audits will be done periodically or in response to specific problems. Utilize broad knowledge of EDP systems and auditing techniques to perform assignments without close supervision.

At least 5 years experience in computer systems or 3 directly in computer-based systems auditing is required, with degree in Business Administration or Computer Science. Previous audit function background in EDP systems is highly desirable.

Please send resume indicating salary record, in confidence to:

PIZZA HUT, INC.
Employment Manager
P.O. Box 428
Wichita, KS 67201
Equal Opportunity Employer

ComputerProfessionals

Most computer professionals are aware that today's most advanced large-system technology was developed by a company that, not too long ago, was virtually unknown. For five years the industry heard rumors of a small, crack team of computer designers in Northern California working on a new generation of high-end, high-performance computers. But, most didn't put much stock in the rumors until, in mid-1975, the first multi-million-dollar system was up and running at the first customer site.

Now the phenomenon of Amdahl is well-known in the industry. The 470V/6 performs as promised. (It is, in fact, the world's price-performance leader.) The company performs as promised. (Amdahl hardware and software support exceeds established standards.)

Consequently, by the end of 1976, over 30 systems valued at more than $125,000,000 were operating within prestigious organizations in the U.S., Canada and Europe. Two-thirds of that 18-month installed base were shipped during the last six months of 1976.

Not widely known, however, is that this "unknown" which suddenly became a major supplier of large systems is still, in terms of staff size, a relatively small company. The kind of company, we believe, where creative, enthusiastic people like to work. It took a lot of creativity and enthusiasm (and hard work that we enjoyed because it was fun) to do what we have done. When we began, we intentionally created a friendly environment where individual efforts are recognized. We're still that way, and we need others like us to stay that way. At Amdahl, you're not lost in a sea of people: we started out 1976 with less that 400 people, and ended with less than 800. There's still room on the ground floor.

We're looking for above-average talent. You can expect an above-average compensation and benefits package. Please direct your response to Manager, Professional Employment, Amdahl Corporation, 1250 East Arques Avenue, Sunnyvale, California 94086. To expedite your application, please indicate on your resume or letter the response number contained in the text of the position offering. We are, of course, an equal opportunity employer.

ENGINEERING SOFTWARE METHODOLOGY & APPLICATIONS MANAGER

You have in-depth knowledge of software tools and applications development and probably have experience with system software development. You have been looking for an opportunity to apply your talents to creating new software development methodologies, managing a group that you will structure to meet the task. Please indicate 4261-E on your response.

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You will lead a highly skilled group of professionals in providing performance evaluation and measurement in support of new product development. You are probably experienced with 370 architecture and performance. Please indicate 4262-E on your response.

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You will plan and develop an advanced DA system, responding to the technical challenges of system and logic level simulation, packaging and layout design, and fault test generation. You will interface with technology and computer development groups defining DA requirements leading to the design, specification and implementation of the total software system. You have an advanced degree in EE or computer science (or some equivalent), as well as DA-related experience. Please indicate 421-E on your response.

SOFTWARE ENGINEERING SPECIALIST

You will specify, design and develop software tools to supplement our engineering software development methodologies. You will find it helpful to be experienced with OS/JCL and PL/1. Please indicate 437-E on your response.

amdahl

LOCAL GOVERNMENT INFORMATION SYSTEMS

Positions available in systems, programming and operations.

PROGRAMMER/ANALYST with 3 or more years of experience in developing complex business oriented systems. Teleprocessing experience preferred.

PROGRAMMER DOS-VS background with minimum of 1 year COBOL. Also RPG or COBOL report writer.

CONSOLE OPERATOR DOS-VS with power. Experience required. Must be familiar with JCL and debugging abends.

Send complete resume, including salary history to:

DATA PROCESSING MANAGER
P.O. Box 306
New Haven, CT. 06502

Programmer/Analyst II

Tarrant County Junior College, Ft. Worth, TX. Salary: $940 per month. Two years of college and two years of experience as an application programmer required. One year of experience required with a bachelor's degree. Position available immediately. Send resume:

Director of Personnel, TCJC
1400 Electric Service Bldg.
Ft. Worth, TX 76102
336-7651

DP-NOW!

Need: Programmer/Analyst; Systems Analyst; DP Mgr; MIS Mgr for large & smaller shops. DATA BASE, MIS, Sys/3; Sys 7; Mini Computers; 360/370; All software packages; competitive salaries at all levels. Desirable locations in Mid-South, SE, SW and other areas. All fees paid by client firms; Confidential, of course! Personnel consultant for the DP professional! Nationwide recruitment and placement. Send resume to:

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Memphis, TN 38117
(901) 767-5160

DATA BASE ADMINISTRATOR

Would you like the challenge of designing an IMS/DC data base for an integrated manufacturing system? Are you motivated by an opportunity to do the initial data base design for the company, establish standards, and monitor the installation of the data base so that it is done right the first time?

If the answers to these questions are an unqualified yes, and if you have previous experience designing IMS/DC data bases, you may be just the person we're looking for. The successful applicant will receive a salary of up to $26,000 annually (based on experience and qualifications); live and work in a quiet, pleasant Iowa city; be totally responsible for the design of a large integrated manufacturing data base; and be an integral part of a multi-billion dollar international corporation.

We need you now! For immediate consideration, send your resume to:

CW Box 4880
797 Washington St.
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There's Still Room on the Ground Floor at Amdahl

FIELD ENGINEERS

Immediate openings throughout the U.S. and Canada. Field candidates will undergo a training period in California on full salary with housing, transportation, and other expenses provided.

You will carry the Amdahl philosophy of customer service as well as your expertise into the field, utilizing your initiative and talents to aid the customer in restoring computer center operations regardless of the origin of the failure. Large system experience essential, preferably on compatible equipment. Please indicate 560-E on your response.

FIELD ENGINEERS: TEMPORARY DUTY IN EUROPE

Immediate openings for field engineers to work at Amdahl installations in Europe as an initial assignment. You will join the permanent field engineering staff, with your first assignment being approximately six months in Europe. Same qualifications as stated elsewhere in this ad for field engineers. Please indicate 905-E/Europe on your response.

FIELD SYSTEM PROGRAMMERS

We are generating constant field openings in concert with the rate at which 470V/6 shipments are growing. We need individuals with both the attitude and aptitude to carry our enthusiasm for unparalleled software support into the field. Immediate opportunities exist throughout U.S. and Canada.

You should have a need to feel useful to Amdahl users in a mixed-vendor environment and have a propensity for exuding the Amdahl enthusiasm. You must have a firm grasp on software systems, in-depth knowledge of large system internals (OS/MVT, VM, VS2, SVS, or MVS) and excellent diagnostic ability. Please indicate 362-E on your response.

Positions offered in this advertisement represent immediate openings only. If you have any talents that you believe could be exercised in the exciting Amdahl environment, please feel free to write us.

MARKETING ANALYSTS/PLANNERS

You will become an integral part of Amdahl's market planning department in developing on-going product and marketing strategies. You will not be working in a vacuum, nor merely generating raw data, but rather playing a recognizable part in shaping future programs. You should have a college degree as well as skills in one or more of the areas below. Please indicate 373-E on your response.

Product Analysis

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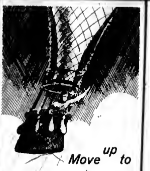

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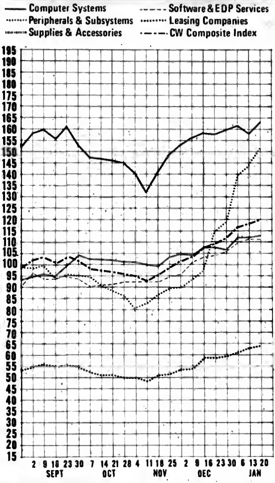

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Three Months Ended Oct. 30

	1976	1975
Shr Ernd	$.26	$.33
Revenue	73,836,000	66,035,000
Tax Cred	824,000	1,521,000
Earnings	2,833,000	3,600,000
6 Mo Shr	.43	.47
Revenue	139,285,000	129,690,000
Tax Cred	1,500,000	2,128,000
Earnings	4,645,000	5,159,000

DATAPOINT

Three Months Ended Oct. 31

	1976	1975
Shr Ernd	$.60	$.57
Revenue	22,533,000	14,452,000
Tax Cred	.....	495,000
Earnings	1,956,000	1,503,000

LUNDY ELECTRONICS & SYSTEMS

Three Months Ended Sept. 30

	1976	e1975
Shr Ernd	$.13	$.20
Revenue	4,526,060	5,303,125
Spec Cred	.....	79,000
Earnings	112,496	176,426

ON-LINE SYSTEMS

Three Months Ended Oct. 31

	1976	1975
Shr Ernd	$.36	$.18
Revenue	3,964,429	2,671,000
Earnings	307,662	153,986
6 Mo Shr	.66	.25
Revenue	7,616,938	5,073,991
Earnings	565,187	213,413

COMTEN

Three Months Ended Sept. 30

	1976	1975
Revenue	$5,741,000	$4,056,000
aSpec Charge	(115,000)	(127,000)
Loss	216,000	277,000
9 Mo Shr	.09	.01
Revenue	17,609,000	12,230,000
Tax Cred	74,000	7,000
Earnings	224,000	15,000

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CLOSING PRICES WEDNESDAY, JANUARY 19, 1977

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EXCN		PRICE 1976-77 RANGE (1)	CLOSE JAN 19 1977	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
O	AMDAHL CORP	23- 40	35 1/4	+ 1/4	+0.7
N	BURROUGHS CORP	79-108	78 7/8	-7 3/8	-8.5
O	COMPUTER AUTOMATION	10- 23	23 1/4	+4 7/8	+26.5
N	CONTROL DATA CORP	18- 27	26 1/4	+1 1/2	+6.0
N	DATA GENERAL CORP	40- 60	43 7/8	+2 5/8	+6.3
O	DATAPOINT CORP	24- 46	26 1/4	-2	-7.0
O	DIGITAL COMP CONTROL	2- 7	6 7/8	+ 1/2	+7.8
N	DIGITAL EQUIPMENT	46- 60	49 5/8	- 7/8	-1.7
N	ELECTRONIC ASSOC.	2- 5	2 7/8	+ 1/8	+4.5
A	ELECTRONIC ENGINEER.	7- 16	9 3/8	- 1/8	-1.3
O	FOUR-PHASE SYSTEMS	13- 21	16 1/4	+ 1/8	+0.7
N	FOXBORO	28- 51	45 1/2	+ 1/2	+1.1
O	GENERAL AUTOMATION	4- 11	8 1/8	+ 3/8	+4.8
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	78-117	79 3/8	- 3/8	-0.4
N	HONEYWELL INC	34- 56	47 1/4	+1	+2.1
N	IBM	227-288	277 1/2	+8 1/2	+3.1
O	MANAGEMENT ASSIST	1- 9	7 5/8	+ 3/4	+10.9
O	MEMOREX	17- 33	27	+3 7/8	+16.7
O	MICRODATA CORP	10- 28	15 1/2	+ 3/4	+5.0
O	MODULAR COMPUTER SYS	3- 14	6 1/8	+ 5/8	+11.3
N	NCR	24- 38	35 1/2	- 5/8	-1.7
O	PRIME COMPUTER INC	4- 18	15 1/4	- 3/4	-4.6
N	PERKIN-ELMER	19- 27	19 1/2	0	0.0
N	RAYTHEON CO	45- 67	59 3/4	+2 1/2	+4.3
N	SPERRY RAND	40- 52	40 1/4	+ 1/8	+0.3
O	SYCOR INC	9- 31	13 5/8	+ 3/8	+2.8
A	SYSTEMS ENG. LABS	5- 10	6 3/4	+ 1/2	+8.0
N	VARIAN ASSOCIATES	12- 17	16 1/4	+ 5/8	+4.0
A	WANG LABS.	11- 20	13 3/4	- 1/2	-3.5
	LEASING COMPANIES				
O	BOOTHE COMPUTER CORP	1- 9	9	- 1/4	-2.7
O	COMDISCO INC	3- 10	9 3/4	+ 1/4	+2.6
A	COMMERCE GROUP CORP	2- 3	2 1/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 3	2 1/8	+ 1/8	+6.2
M	DATRONIC RENTAL	1- 8	1 1/2	- 1/8	-7.6
P	DCL INC	1- 1	7/8	0	0.0
N	DPF INC	5- 8	8 1/8	+ 3/4	+10.1
N	ITEL	6- 16	15 1/2	+1 1/4	+8.7
M	LEASCO CORP	6- 22	21 1/2	+1 3/4	+8.8
O	LEASPAC CORP	0- 1	3/4	0	0.0
O	NRG INC	0- 1	1/4	+ 1/16	+32.9
A	PIONEER TEX CORP	6- 9	8 1/8	0	0.0
N	U.S. LEASING	7- 12	11	0	0.0
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 3	1 3/4	0	0.0
O	ANACOMP INC	6- 11	7 3/4	+ 5/8	+8.7
A	APPLIED DATA RES.	2- 7	5 3/4	- 1/8	-2.1
N	AUTOMATIC DATA PROC	17- 35	27 7/8	- 1/8	-0.4
O	COLEMAN AMERICAN COS	2- 6	2 1/4	0	0.0
O	COMPU-SERV NETWORK	3- 15	14	+2 3/4	+24.4
O	COMPUTER DIMENSIONS	3- 7	6 1/2	- 3/8	-5.4
O	COMP ELECTION SYSTMS	5- 9	6 1/2	- 1/2	-7.1
O	COMPUTER HORIZONS	1- 2	1 1/4	0	0.0
O	COMPUTER NETWORK	2- 8	7 1/4	+ 5/8	+9.4
N	COMPUTER SCIENCES	4- 9	8 3/4	+ 1/2	+6.0
O	COMPUTER TASK GROUP	1- 2	1 1/4	0	0.0
O	COMPUTER USAGE	2- 6	2 3/8	0	0.0
O	COMSHARE	2- 9	5 1/4	+ 1/4	+5.0
O	DATA DIMENSIONS INC	2- 5	4 1/8	+ 1/8	+3.1
O	DATATAB	1- 2	1 3/8	- 1/8	-8.3
N	ELECTRONIC DATA SYS.	12- 18	17 3/4	+ 5/8	+3.6
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	2 3/8	0	0.0
O	IPS COMPUTER MARKET.	1- 2	3/4	- 1/4	-25.0
O	KEANE ASSOCIATES	2- 4	2 1/2	+ 1/4	+11.1
O	KEYDATA CORP	1- 5	1 3/4	0	0.0
A	LOGICON	3- 8	7 3/4	+ 1/4	+3.3
A	MANAGEMENT DATA	1- 3	1 3/8	- 5/8	-31.2
A	NATIONAL CSS INC	13- 25	23 3/4	- 7/8	-3.5
O	NATIONAL DATA CORP	4- 7	5 7/8	- 1/4	-4.0
A	ON LINE SYSTEMS INC	17- 23	20	- 7/8	-4.1
N	PLANNING RESEARCH.	3- 5	4 1/4	+ 1/4	+6.2
O	PROGRAMMING & SYS	1- 1	3/8	+ 1/8	+50.0
O	RAPIDATA INC	2- 5	2 3/8	- 1/8	-5.0
O	REYNOLDS & REYNOLD	13- 21	19 1/2	+ 1/4	+1.2
O	SCIENTIFIC COMPUTERS	1- 1	1	- 1/8	-11.1
O	TYMSHARE INC	14- 20	18 1/2	+ 1/2	+2.7
A	URS SYSTEMS	3- 5	3 7/8	0	0.0
N	WYLY CORP	1- 7	2	- 1/8	-5.8
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	8- 14	13 5/8	+ 3/8	+2.8
O	ADVANCED MEMORY SYS	4- 10	8	+ 1/8	+1.5
N	AMPEX CORP	5- 10	9 3/8	+1 1/8	+13.6
O	ANDERSON JACOBSON	2- 4	3 1/4	- 1/8	-3.7
O	APPLIED DIG DATA SYS	13- 25	16	+1 3/4	+12.2
O	BEEHIVE MEDICAL ELEC	3- 11	10 1/2	+ 1/2	+5.0
P	BOLT,BERANEK & NEW	7- 11	7 7/8	+ 1/8	+1.6
N	BUNKER-RAMO	5- 10	9 1/4	+1 1/4	+15.6
A	CALCOMP	4- 7	4 5/8	- 1/2	-9.7
O	CAMBRIDGE MEMORIES	0- 6	1 1/2	+ 1/4	+20.0
N	CENTRONICS DATA COMP	20- 36	25 3/4	+ 1/2	+1.9
O	CODEX CORP	22- 42	37 1/2	+4	+11.9
O	COGNITRONICS	1- 1	1 1/8	+ 1/8	+12.5
O	COMPUTER COMMUN.	1- 6	5 7/8	- 3/8	-6.0
O	COMPUTER CONSOLES	4- 7	4 3/4	+ 1/4	+5.5
A	COMPUTER EQUIPMENT	1- 3	2	+ 1/8	+6.6
O	COMPUTER TRANSCEIVER	1- 3	1	- 1/8	-11.1
O	COMTEN	4- 11	11 1/4	+1 1/4	+12.5
N	CONRAC CORP	20- 27	24 7/8	- 5/8	-2.4
O	DATA ACCESS SYSTEMS	1- 5	4 1/4	0	0.0
O	DATA 100	6- 13	7 5/8	- 3/8	-4.6
A	DATA PRODUCTS CORP	5- 15	12 1/8	0	0.0
O	DATA TECHNOLOGY	1- 3	3 1/4	0	0.0
O	DATUM INC	1- 2	1 1/4	- 1/8	-9.0
O	DECISION DATA COMPUT	1- 4	1 7/8	+ 1/8	+7.1
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
N	ELECTRONIC M & M	1- 4	4 3/8	+ 1/8	+2.9
O	FABRI-TEK	1- 1	1	+	+6.2
O	GENERAL COMPUTER SYS	0- 2	1/2	0	0.0
N	HAZELTINE CORP	4- 12	11 3/8	+1 1/8	+10.9
N	HARRIS CORP	28- 57	32 7/8	+4 3/8	+15.3
A	INCOTERM CORP	9- 20	12 3/4	+ 1/2	+4.0
O	INFOREX INC	3- 7	5 7/8	+ 1/8	+2.1
O	INFORMATION INTL INC	10- 18	13 1/2	- 1/8	-0.9
O	INTEL CORP	47-109	56	+2	+3.7
A	LUNDY ELECTRONICS	3- 7	4 5/8	- 1/8	-2.6
O	MSI DATA CORP	3- 7	6 1/4	+ 1/8	+2.0
N	MILGO ELECTRONICS	15- 22	21 5/8	+ 7/8	+4.2
N	MOHAWK DATA SCI	3- 10	7 1/4	+ 1/2	+7.4
O	PENRIL CORP	1- 3	2	- 1/8	-5.8
A	PERTEC CORP	5- 8	8	- 1/4	-3.0
P	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	2- 10	1 1/2	0	0.0
O	QUANTOR CORP	4- 6	4 3/4	0	0.0
O	RECOGNITION EQUIP	6- 11	9 3/8	0	0.0
N	SANDERS ASSOCIATES	6- 11	10 5/8	+ 1/2	+4.9
O	SCAN DATA	1- 4	1 3/8	- 1/8	-8.3
O	STORAGE TECHNOLOGY	9- 13	12 1/4	+1	+8.8
O	T BAR INC	5- 10	7 1/8	+ 1/8	+1.7
O	TALLY CORP.	4- 6	5 3/8	0	0.0
O	TEC INC	3- 9	7 1/2	- 1/2	-6.2
N	TEKTRONIX INC	45- 69	59 1/2	-3 3/4	-5.9
N	TELEX	2- 5	3 3/8	+ 1/2	+17.3
O	WANGCO INC	11- 22	17 1/2	0	0.0
O	WILTEK INC	1- 2	1/4	- 1/8	-33.3
	SUPPLIES & ACCESSORIES				
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	3- 5	3 1/2	- 1/8	-3.4
P	BARRY WRIGHT	6- 11	10 3/4	+ 1/4	+2.3
O	CYBERNATICS INC	0- 1	5/8	0	0.0
P	DATA DOCUMENTS	25- 45	41	-3 1/4	-7.3
O	DUPLEX PRODUCTS INC	13- 24	14 1/4	- 3/8	-2.5
N	ENNIS BUS. FORMS	6- 8	6 1/8	- 1/8	-2.0
O	GRAHAM MAGNETICS	8- 13	11 1/2	+ 1/2	+4.5
O	GRAPHIC CONTROLS	13- 19	16 1/2	+1 3/4	+11.8
N	3M COMPANY	52- 66	53	-1	-1.8
O	MOORE CORP LTD	32- 51	34 1/2	- 1/2	-1.4
N	NASHUA CORP	11- 20	17 5/8	0	0.0
O	STANDARD REGISTER	15- 19	18 1/2	0	0.0
O	TAB PRODUCTS CO	5- 15	15	+ 3/4	+5.2
N	UARCO	19- 25	21 7/8	+ 1/8	+0.5
A	WABASH MAGNETICS	4- 12	11 3/4	+ 1/2	+4.4
N	WALLACE BUS FORMS	19- 25	20 7/8	- 1/8	-0.5

EXCN: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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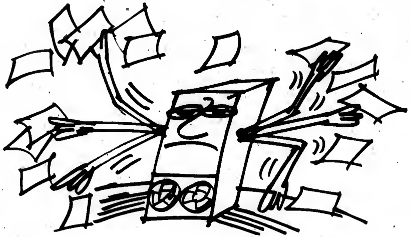

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